CARE INTERNATIONAL SIERRA LEONE

FINAL REPORT

ON

EVALUATION OF WATER, SANITATION AND HEALTH EDUCATION PROGRAMME OVER PAST FIVE YEARS

1995 - 2000

Submitted by:

Anthony Waterkeyn B.Sc. M.Sc.

25th November to 15th December 2000

C O N T E N T S

1. INTRODUCTION

Care International is one of the few NGOs that has been prepared to remain in Sierra Leone throughout all of this country's recent very turbulent history. Despite the many periods of extreme danger that have repeatedly prevailed in the country, Care's staff have been determined to continue providing humanitarian assistance in its many forms. One can but humbly salute them for such courage and altruism.

Care's support for rural drinking water supplies in Sierra Leone commenced in 1980. By 1986 this intervention had expanded so that it now includes Water, Sanitation and Health Education. This "three-legs-of-a-stool" approach has continued to this day. However, during the past ten years of warfare, anarchy and bloodshed, what may originally have been intended as a "development" programme has frequently had to re-focus and adapt to become one of "emergency".

Such major disruption to Care's activities has quite understandably produced some negative consequences as far as project implementation and accomplishments are concerned. Projects have had to change, virtually overnight, from Development "mode" to that of Emergency. The war has forced tens of thousands of internally displaced people (IDP) to leave their homes and look for safety elsewhere. Whole districts have been virtually destroyed: houses, schools, shops and businesses, churches and mosques…in fact just about everything, burnt and people slaughtered.

Over the years Care has had to move project staff from one district to another simply to avoid the worst of the killing that was going on. For example, since 1994 the WatSan project alone has had to move from Moyamba district to Makeni and then on to Port Loco and then from there to the Western Peninsular near Freetown before finally returning to Moyamba again in the past year. All this geographic relocation of projects has obviously been extremely disruptive to all concerned as well as the projects themselves.

Such difficulties have been further compounded by the "stop-start" and relatively short-term nature of most donor funding. Care's donors have quite understandably been rather cautious about spending good money after bad in such an unstable political and social environment.

It is against this backdrop of ten-years of war and anarchy that this Evaluation Report on Care's Water, Sanitation and Health Education activities of the last few years must be viewed. It has quite simply not been possible to undertake a technical evaluation for at least the past five years. As a direct consequence various issues that are highlighted in this Report, which under normal peaceful circumstances would have been addressed and rectified much sooner, have been allowed to continue.

This Technical Evaluation inspected Care's Projects in three Provinces: Western, Southern and Eastern covering four districts: Moyamba, Bonthe, Kenema and Peninsular. It is hoped that the various recommendations it contains will prove to be helpful to Care and its team of dedicated WatSan staff. Although a number of villages visited have Shallow Wells which were constructed by Care well over ten years ago during the 1980s, most of the water and sanitation facilities inspected were more recent having been constructed between 1995 and 2000.

2. DRINKING WATER SUPPLY

2.1 Background

When compared to most countries in Northern, Eastern and Southern Africa, where water may well be scarce and recurrent droughts are a regular feature, Sierra Leone by contrast is indeed a country which is blessed with an abundance of sweet water, both above and below the ground. Access to safe drinking water should be relatively straightforward. And yet at this time, the beginning of the Third Millennium, ***less than 20% of the rural population has ready access to a safe drinking water supply*** and over 75% of the entire population is undernourished and living below the poverty line. The global UNDP Human Development Index ranks Sierra Leone last at 174th position.

2.2 Evaluation of Water Facilities

During this Evaluation, field trips were undertaken to districts in Western, Southern and Eastern Provinces. Observations in numerous villages clearly demonstrated that there is at present, after 10 years of war and unrest, a minimal capacity or incentive on the part of most communities to maintain, repair or replace water facilities when they fail, no matter how simple the technology. They simply put up with the "inconvenience" and quickly return to their traditional sources of drinking water. These sources are seldom more than a short walk away.

> ***Approximately 75% of the Shallow Hand-Dug Wells that were inspected in Moyamba, Bonthe and Kenema Districts are failing to deliver reliable, safe, drinking water. 90% of the Gravity Pipe Schemes constructed for the villages around the Western Peninsular are not working.***

In Moyamba district alone Care has, since 1984, constructed 218 Shallow Wells in 176 villages of 8 Chiefdoms. It is thus depressing to find that such a high proportion of them (over 75%), are not providing **safe** drinking water to the villagers as had been the sole intention under this particular intervention.

There are a number of reasons for this, which are identified below. However, one particularly important factor has been the war itself. Most villagers greatly fear that when the RUF rebels were in the process of destroying their homes and villages that they may well have poisoned their wells. Most villagers fear that bodies were dumped into them. They refuse to use the wells until they have been completely de-watered and rehabilitated so that they can be reassured that their wells are safe to use. Such has been the devastating effect of the war on the lives of so many people in Sierra Leone.

2.3 Range of Water Supply Technologies

The technologies that have been employed during the past 20 years for the provision of safe drinking water are each basically appropriate and sound in themselves but they frequently fail when it comes down to the engineering detail. The two technologies inspected as part of this Evaluation, are:

i. gravity-feed pipelines
ii. hand-dug shallow wells

Gravity-feed systems are probably the most elegant of the technology choices in that they can be designed to deliver safe drinking water out of taps that require no effort on behalf of the user to extract the water. Maintenance can usually be designed to be simple and within the capacity of rural communities.

Shallow Wells on the other hand require a water-lifting device of some sort. For the past twenty years the lifting device which has been most widely installed has been the ***simple pulley with rope and bucket***. The reasoning for this choice was that future maintenance and the sustainability of the facility was of major concern. Poor village communities would at least be able to replace the rope and buckets themselves when they wore out but they would be unable to replace wearing parts of anything more sophisticated and expensive. In other words:-

> ***The long-term sustainability of a safe drinking water supply for rural communities must determine the choice of technology employed.***

There is certainly merit in this process of reasoning. However there are serious flaws in the decisions that subsequently followed. These flaws have been compounded over the years since that early decision to use the pulley system was taken by GoSL.

2.4 Problems with the Water Supply Programme

2.4.1 Gravity-Feed Pipelines

An inspection of the pipeline schemes that were installed in 13 fishing villages along the coast of Western Peninsular between 1995 and 1996 indicated that poor engineering and lack of supervision were the basic cause of the problems that have resulted in 90% of the piped schemes that were inspected having completely failed. Reasons for this failure include:-

- Dams were badly constructed and water gushed from under the walls;
- No robust gravel boxes were built to keep out leaves and other debris from being sucked into the intake pipes;
- Position of intake pipe was found to be incorrect;

- Incorrect pipe sizes were frequently installed which resulted in subsequent failure of systems. In one instance (Tombo Village), new polyurethane intake pipes completely collapsed immediately after commissioning. These two 2" diameter "soft" pipes were used to connect the new dam to the old main gravity feed consisting of a 4" GI pipe. As the "hard" GI pipe has twice the cross-sectional area (of 2X2" pipes) this had obvious disastrous consequences;
- Little if any attention was given to designing for future community maintenance by providing sufficient "wash-out" points and access fittings along the length of the pipeline so that whenever blockages did occur the communities could clear them with the very few tools in their possession;
- Poor reticulation networks were evident in every village and no provision had been made for various sections of the distribution to be isolated so as to allow easy maintenance of faulty outlets or leaking pipes;
- Very little attempt appears to have been made to dig proper trenches for the pipeline so as to protect the pipes;
- Very poor quality taps had been fitted which obviously failed early on in most cases.

When we first visited the various villages we were told that the lack of water at any of the tap-stands was simply caused by the fact that the villagers had been too lazy to carry out any maintenance on the scheme as they had been instructed to do before "hand-over".

It was only on much closer inspection of the scheme that it soon became apparent that the pipeline simply could not be easily maintained by anyone and that it was not in any way the fault of a so called "lazy community" that did not care. We actually found that they did care very much and were frustrated that the whole system had failed, apparently within the first year after completion.

However, the full context in which this project failed must be appreciated. By 1994 when the project commenced in the Western Peninsular, Care had been forced, at very short notice, to abandon all WatSan projects throughout the rest of the country because of the war. The Peninsular was the only area where activities could still safely take place. However, the situation was all very volatile and thousands of people were being displaced. For example in Tombo Village, the population was about 8,000 at the start of activities in 1994, increased to 15,000 by 1997 and it now has a population of almost 30,000. This is mainly as a result of the massive influx of IDPs. Such a rapid, three-fold increase in demand on **any** water supply system is way beyond normal expectations when it comes to planning and design. This also impacted negatively on the project's ability to work closely with the communities as they were all in such a state of confusion. It became difficult to get communities to even contribute their labour in many instances, which meant that such activities as digging trenches simply did not get done.

There was also the fact that the Peninsular was, as a direct consequence of the war, crowded out with other NGOs. Some were offering to pay local communities for their labour contribution, others were offering much more in the way of subsidies etc. which made it very difficult for Care to implement the project with the full community participation and co-operation as would normally have been the case.

2.4.2 Shallow Hand-Dug Wells

A considerable amount of hard work by Care staff has gone into constructing a vast number of Shallow Wells in numerous villages around the country during the past twenty years. Exact figures were difficult to come by during this Evaluation because local records were lost when RUF rebels looted and burnt some of Care's offices.


Recently completed well with very good concrete lining but not yet in use after 3 months because of delays in purchasing rope and bucket!

In virtually every case the quality of the concrete work was found to be good (possibly even over designed) and certainly over 90% of wells we inspected do still provide water throughout most of the year.

However, when it comes to the actual use of the well and the quality of the water, there are very serious problems. ***Around 75-80% of the wells are quite simply NOT providing "safe" drinking water which was, after all, the whole point of the exercise.*** Even the remaining balance must be viewed with caution. This intervention was undertaken in order to provide reliable, good quality drinking water and not simply a convenient access to water. In fact, most villages we visited appear to have surface water very near to the villages and many even have traditional wells within the villages so they are certainly not desperate for water as such. What they need is a reliable source of good quality, "safe" water to drink.

As explained above, many villagers are still afraid that when their villages were attacked, the RUF rebels may have poisoned their wells and/or dumped bodies into them. The villagers understandably refuse to use their wells until they have been completely de-watered. They actually want to see for themselves that the wells are safe to use. Some de-watering, which only takes about one hour to accomplish, has been carried out by Care.

However, a serious problem will remain even if the wells are all eventually de-watered and chlorinated. Unless every well can be securely sealed, the fear will persist that they will remain vulnerable to poisoning. Such fears have become quite widespread since the start of this intervention over twenty years

ago. It is not just the war. Villagers even fear that their "domestic" enemies or even vandals might be tempted to put poison into their wells at night.

Of all wells we inspected, less than 25% can be considered to be providing relatively safe drinking water of the quality originally intended. The remainder has at least one of the following problems:

- ***The community does not have a rope and/or bucket to access the water;***
- ***The pulley is broken or missing;***
- ***There is likely contamination of the water in the well (through misuse);***
- ***The lid is broken and cannot be locked in place;***
- ***The concrete apron is in disrepair (risking contamination of the well);***
- ***The fence is broken and/or there is no gate to keep animals from contaminating the surface on which the rope is usually placed.***

2.4.3 Rope and Pulley System

(i) ***A simple pulley system of the type that has been installed all over Sierra Leone offers no mechanical advantage in lifting a bucket of water.*** As such it is very hard for young children and the old and infirm to access water from a village well, particularly if it is quite deep. In every village that we visited where a well had been constructed, the Village Chiefs or VDC Chairmen or some other village leader invariably informed us that the village had a bye-law which forbids children under the age of 15 from using the well.

Old Man straining to lift bucket

Woman reaching for bucket

However, it is generally understood that women and children are traditionally the ones who collect water… a chore which men prefer to avoid wherever possible. Yet the choice of technology means that ***children under 15 years of age, who make up 50% of SL's total population, have in effect been excluded from collecting water from the village well***.

We were repeatedly told by the villagers that they feared that children would not be able to lift the water safely and were likely to drop the rope or bucket or some other object (including themselves) down the well. This may indeed be a justified fear but it does not diminish the fact that a technology that in effect excludes children and places even more of a burden on the already overworked women of the village is surely not appropriate.

(ii) The heavy-duty imported pulleys, which had previously been provided under Care's earlier WATSAN projects, were beautifully made with sealed bearings and a robust anodized frame. All the 10-15 old pulleys of this type which were inspected were found to be in good working order.

However, these imported pulleys were prohibitively expensive with a landed cost several times higher that the "short-life" ones which have been fitted during the past 10 years. Recent figures indicate that the locally fabricated pulley-frame costs US$93.75 and a pulley wheel, (small size) will cost US$ 21.88. Thus a total cost for the locally fabricated pulley system is US$115.63 or **L231,260.** (RoE:12/12/00: US$1=L2,000).

The ***locally fabricated pulley-wheels*** (made in Freetown) are of greatly inferior quality to those that Care previously imported in the 1980s and ***are likely to fail within a year or two of heavy use***. ***They are thus seen to be expensive (at L43,760). The villagers only barely manage to replace their buckets and ropes when they wear out*** and in many cases, we noted that the period for replacement sometimes may take as long as several weeks or even months while the village tries to raise the necessary money. A new rope can cost anything between L10,000 and L20,000 and a plastic bucket costs around L5,000. Replacement of the pulleys is quite obviously beyond the capacity of the villagers, as they have no savings so soon after the war and their priorities are to rebuild their houses etc. In any event, ***pulleys and "open wells" are no longer accepted by most if not all villagers*** (see below).

Worn Pulley

Typical well

Broken bucket

(iii) In many instances, people were observed standing on the top slab. This was in order to have an easier lifting stance to simply heave up buckets of water without the "help" of a pulley. In about 20% of cases, pulleys have either fallen off or the central axle has simply collapsed through wear and corrosion. This practice of standing next to the opening and spilling water about the place is obviously ***unhygienic as it risks faecal contamination (from dirty feet) entering the well.*** The quality of water in a well which is being "misused" in this way will be suspect.

It is worth emphasising what has already been mentioned above. Most villages have a stream, swamp or pond within a reasonably short walking distance. This changes the whole equation when looking at the provision of "safe-water" facilities. It is quite easy and tempting for villagers to simply resort to the old water source of the village than go to the trouble and expense of replacing ropes or buckets let alone expensive, short-life pulleys. In drier countries it may be a matter of life or death to keep the water facility operating and there would then be a much greater willingness to provide the funds for repair. This however is certainly NOT the case in Sierra Leone at this time so soon after ten years of war.

(iv) The Pulley System, even when the pulley-wheel is working and a rope and bucket are in place, does not solve the problem of ***rope contamination***. In almost every instance the rope was found to be lying on the ground where it would be stepped on by unclean feet or lie in possibly contaminated puddles of water through which animals would pass. Only one well was found to be fitted with a fence AND a gate.

Pulley missing. Better type of lockable lid (without hinges)

A busy water-point. Note heavy-duty pulley and rubber rope on ground. Young children are not able to draw water from such wells (yet 50% pop. of Sierra Leone is <15years old)

In any event numerous hands that may well be faecally contaminated are hauling on the rope. There is thus a greatly increased risk of such dirty, much handled ropes spreading faecal contamination into the water down in the well. Again, as mentioned above, this brings into question the whole reason for providing the well in the first place.

(v) The final point to make regarding the Rope and Pulley system is that it is quite simply ***not popular or acceptable*** with local villagers.

2.5 The Hand-Pump Option

There was ample evidence within virtually every village that we visited throughout this evaluation that villagers are extremely keen to replace their rope and pulley systems with one of the new hand-pumps. All Care WatSan staff held the same view.

Now that quite a number of handpumps have been installed in rural areas across the country, many people have seen for themselves how much easier life can be with one of these wonderful water-lifting devices. Even children and very old people can collect water from a well with relative ease. And, most important, the well can be completely sealed and there is virtually no danger of an enemy being able to poison the well.

Quite a range of different makes of handpump is already in evidence depending on the whim or nationality of the NGO or donor involved. To-date little if any effort has been made to standardise the hand-pump policy in Sierra Leone. Apparently this is about to change and UNICEF and others have started discussions with GoSL in order to produce a National Policy on Hand-Pumps.

It may be helpful to consider the experience from a few other countries that have already gone down this particular road.

2.5.1 Hand-pump Experience in Other Countries of Africa

The hand-pump experience from some other African countries may be helpful in trying to analyse the situation that currently persists in SL.

(i) For the past eighty years Zimbabwe has manufactured a very reliable and robust "home-grown" standardised hand-pump, which has become increasingly "user-friendly" in design (in support of VLOM and CBM). Spare parts are relatively easy to access as there are four factories that manufacture the pumps to a standard national design.

(ii) By contrast, SL does not yet have a well-established industrial base. All hand-pumps and spare parts will have to be imported for the foreseeable future. This requires either hard currency, which is in extremely short supply, or unending donor support.

(iii) However, 40-60% of Zimbabwe's pumps are out of service at any time. Despite attempts at introducing CBM, few rural communities seem willing or able to maintain their pumps. Would the situation in SL be any different?

(iv) **When** GoSL decides to standardise the type of hand-pump that it wants used in SL and **if** spares for such a hand-pump programme are made available in most corners of the country; it is still ***extremely unlikely that the pumps will be maintained by rural communities in the foreseeable future***. Rural communities in SL find it difficult to replace ropes and buckets, as we found was the case in almost every village we visited. When it comes to repairing hand pumps, spares even if accessible, will likely be expensive and quite beyond the means of local communities.

(v) Only those rural communities who live in dry, drought-prone parts of Africa and who are utterly dependent on a hand-pump for their very survival are more likely to respond to CBM in a meaningful way. In SL where water scarcity is certainly not a problem this scenario simply does not exist.

Hand-pump fitted on well after pulley-system failed (i.e. pulley fell off). How long before this more complex and expensive hand-pump fails??

2.6 RECOMMENDATIONS FOR WATER PROGRAMME

Having voiced the above misgivings about the long-term viability and sustainability of use of hand-pumps for rural water supply, it is almost inevitable that there will be an ever-increasing demand for them from both the rural communities themselves as well as from the donors. In facing this reality a few issues should be considered:

2.6.1 Standardise Type of Hand-pump for Sierra Leone

(i) When hand-pumps fail, which eventually they certainly will do, sooner or later, they are likely to remain out of service for extensive periods of time if not indefinitely. The wide variety of hand-pumps currently being installed by "helpful" donors should be halted. The GoSL should make a rational decision to ***standardise the type of hand-pump*** that it will allow to be imported and used in SL.

Certainly it became quite obvious from the field visits that a number of very recently installed modern hand-pumps have already failed in one way or another. In some cases it was mechanical failure, in others it was that the level of the water in the well had dropped below the pump intake. In either case there was absolutely nothing the local community could do to remedy the situation themselves. All they can do now is to simply hope and pray that the "kind donor," who converted their well from rope and bucket and installed a hand-pump, will eventually return someday to sort out the problem.

(ii) Once a standardised hand-pump has been selected for Sierra Leone, such handpumps should ONLY be installed where absolutely necessary and where ***long-term maintenance can virtually be guaranteed***. Such instances may be at schools and clinics or in particularly high-density settings.

It is essential to ensure that whoever installs the handpump is also going to remain responsible for ongoing maintenance; be it the mission school, clinic or possibly one of the Ministries (e.g. Health, or Education, or Local Government or whatever). ***The local community is unlikely to be able or willing to manage and maintain their "communally owned" pumps and pay for spare parts for many years to come.***

> ***For any organisation to install a handpump in a rural village of Sierra Leone, thereby raising great expectations and much gratitude, and then simply walk away after "handing over responsibility" for its long-term maintenance to the villagers, would be wrong in the present Sierra Leonean context.***

2.6.2 The Windlass

Under this section where the use of hand-pumps is being considered, it may well be worth taking a fresh look at one of the oldest machines known to man, probably even pre-dating the discovery of the wheel: ***the windlass***. Although it is such a very old technology (certainly found in the Babylon region over 3,000 years ago) it may quite justifiably be considered to be "a pump" as it offers adequate mechanical advantage and efficiency in the lifting of water from depth.

It is very strange that this wonderfully simple "hand-pump" which, just like the wheel, has stood the test of time, was not incorporated into the shallow well programme many years ago. It has so many advantages over the pulley system:

(i) The ***windlass does provide mechanical advantage and can thus be considered as a form of hand-pump***. Even a child can manage to raise water safely using this technique.

(ii) A windlass is ***simple to manufacture locally*** and is relatively ***inexpensive***. Village blacksmiths with basic welding equipment can be taught how to manufacture a perfectly acceptable and very robust windlass.

(iii) A steel windlass is almost ***indestructible***. It should provide good service for many decades.

(iv) ***Easy maintenance***. Villagers can certainly be taught how to replace the only wearing parts, the two bearings, which support the windlass. Locally available materials such as old car tyres or blocks of hard wood may be used for this purpose. The bearings can be "greased" using locally available animal fat. In the case of a wooden bearing, if it is first boiled in old engine oil for about 24 hours and then allowed to cool so that the oil is absorbed into the wood fibres, then the bearing is likely to last for decades.

(v) The windlass concept is ***easily understood*** by local communities which is certainly not usually the case with the handpump.

(vi) The adoption of windlass "hand-pumps" should provide ***opportunities for local employment*** in the fabrication of the windlasses themselves as well as the support bearings.

(vii) Such "local manufacture" will ***enhance sustainability*** of the technology and offer good opportunities for ***replication and expansion*** even after the donor-funded part of the project comes to an end.

(viii) ***Windlasses keep the rope safe and out of harm's way***. It is far less likely to become contaminated in the first place let alone to introduce any contamination back into the well. The need to man-handle the rope is minimised. So too is the need to stand on the top slab near the opening to get better leverage as mentioned above. Ropes and buckets are likely to last longer because they are properly rolled up and stored.

(ix) Shallow wells with sanitary seals, lockable lids and steel windlasses can be ***constructed, owned and managed effectively by individual families***. Such Upgraded Family Wells have many advantages over "communally" owned ones. Refer 2.6.5 below.

Traditional Family Well near Bo. A tyre is used to protect rim; planks to cover

Upgraded Family Well in Zimbabwe

2.6.3 Lockable Well-Cover Lids

As highlighted earlier in this Report, a lockable lid is clearly an option that all villagers require for their wells. However the earlier types of lid which could be locked with a cross bar and which did not require any hinges were certainly found to be much more robust and were more likely to last longer. As with the pulleys, the quality of the steel lids that have been fitted on the wells in recent years has been steadily declining. An inspection of such lids that have been installed within the past two years reveals that about 80% have either fallen apart or are about to. The main problem is with the hinges, which were found to be rusting and seizing up, within the first year of installation. No attempts at lubricating the hinges with oil was evident at any well that we inspected. The current cost of the lids being fabricated in Freetown is US$53.13 (**L 106,260**). Just as with the pulleys, such costs are way beyond the capacity of villagers to replace at this time, especially so soon after the war when they have no savings.

With crucial fittings like pulley wheels and lockable well-cover lids failing after a relatively short period (only 1-2 years) and which are not being replaced by local

communities, the sustainability of "safe" drinking water supplies for the villages under the current programme, is brought into serious question.

2.6.4 Access into the Well

When it comes to maintenance by the village community it would help them if they had a means of access down the well. This would result in the village being able, on those occasions when a rope or bucket is dropped down the well by mistake, or when they need to send someone down to clean out the well, that they will be able to do so relatively easily themselves. Such access by means of simple stirrup-shaped brackets set into the concrete lining at one-meter intervals down the well would be helpful. The brackets could be inserted quite easily after each stage of concrete lining is completed. They should ideally be made of at least 16mm diameter steel reinforcing rod. Not a single Shallow Well that we inspected has been fitted with such access. Most wells range from 8 – 12 meters deep. Few are over 16 meters.

2.6.5 Upgraded Family Wells

In most of the villages, there is ample evidence of the existence of "***traditional wells***". These are usually unlined holes in the ground reaching down into the aquifer with sometimes an old car tyre at the top to protect the rim. Little effort, apart from some sort of lid, is made to protect the quality of the water in the well or the area surrounding the well. The point is however that such wells do exist all over the country and that ***individual families already own many of them***.

This is indeed a wonderful base from which to develop the Upgraded Family Well concept. These are relatively simple structures, which consist of a lined-well complete with head-works (apron and run-off) and, to crown it all, a locally made windlass "hand-pump". A tin lid is also fitted which the owner can lock into place.

The cost of constructing such Upgraded Wells is considerably less than that of the more conventional type currently being promoted. Between 10 - 15 Upgraded Wells could be constructed in place of just one Conventional Well (as currently being constructed under the existing programme by Contractors using extensive reinforced concrete, shuttering etc.).

Access to remote villages (e.g Gondoma) will be very much easier with this simple technology as there will be no need to transport heavy loads of cement, shuttering etc. by truck down a road. All materials can be carried in as head loads along simple bush paths.

Local Village Well-Sinking Teams could certainly be established to construct the Upgraded Wells. Such Teams would require some basic training as well as the provision of some tools and equipment. Well-sinking teams could go around constructing perfectly adequate wells for the whole community. It is also probable that the time to construct the Upgraded Wells will take only weeks rather than months (sometimes over six months) as is the norm with the current more conventional type of well construction.

This would be very good for the whole village, as there would then be the means to construct Upgraded Wells wherever and whenever desired. Village communities and individual families would also be able to arrange to pay for these same Well-Sinking Teams to deepen, repair and generally maintain all wells in the village as required. All the skills for ***long-term sustainability*** would have been transferred to the local community in other words.

It would also be very good for the individual members who are employed in these Well-Sinking Teams. One of the greatest threats the country appears to be facing at the moment is unemployment, particularly among the youth. The Kamajors and the youth in general need something constructive to do with their time and a means of earning an honest living. This is an urgent matter in order to avoid at least some of them from turning to banditry as a means of survival.

The Upgraded Well approach, being based at village level, should also open up opportunities for a host of other potential income-generating activities, particularly for local youths and other members of the village. In addition to the employment opportunity of "well-sinking", bearings for the windlasses will be required (as described more fully in 2.6.2- iv) and ropes and buckets will be needed on an ongoing basis. Perfectly acceptable "ropes," which had been made from old car tyres, were inspected in several of the villages. They were selling for anything between L10,000 and L20,000. Buckets too could be made within the village setting from old rubber tubes (from car tyres).

In local towns like Bo and Moyamba, with a little training and assistance from the project, it would certainly be possible to have local blacksmiths manufacture perfectly acceptable steel windlasses.

So too could local tinsmiths be persuaded to augment their incomes by producing lockable lids for the wells.

A vital aspect of the Upgraded Family Well is that it offers the possibility of "<u>private ownership</u>" by individual families. This has some interesting effects:

- As a direct result of private ownership, families are much more likely to contribute a substantial amount to the actual cost of

constructing the well (in Zimbabwe this contribution amounts to over 70% as compared to contributions in the case of conventional wells which is only 5-10%);

- The likelihood of the facility being properly maintained and managed by individual families is almost guaranteed as compared to "communal" facilities where this tends to be notoriously difficult and unreliable;

- Being much closer to home, families tend to use more water for personal hygiene. This immediately has a positive impact on health in the family.

Although this may all sound a bit "pie in the sky," it will certainly be worth at least attempting such a project, on a pilot basis, in a few carefully selected villages in Sierra Leone. This is exactly how the Upgraded Family Well projects got under way in Zimbabwe (refer 2.6.6 below).

Timber supports for windlass **Clean apron, run-off & lid**
These supports are >10 years old and are easy and cheap to replace by owner
Old engine-oil is used to lubricate windlass bearings

2.6.6 Upgraded Family Wells in Zimbabwe

To end this discussion on "Recommendations for the Water Programme in Sierra Leone", it may be worth again looking at recent developments in Zimbabwe. As mentioned above, that country has been engaged in a hand-pump programme for the past eighty years and today has over 35,000 hand-pumps fitted on boreholes and deep wells across the country. In 1993 Mvuramanzi Trust was established to promote the construction of Upgraded Family Wells by offering a subsidy consisting of ***3 bags of cement for the head-works, a steel***

windlass and a tin lid to those families who had completed the construction of a lined well.

The demand for this "new" technology has spread like wildfire across the country. Today, only seven years since the start of this intervention, there are already ***over 33,000 families*** who have constructed their own Upgraded Wells (almost the same number as the total number of hand-pumps installed during the past 80 years). Many of the wells are over 20 meters deep. These Family Wells are now scattered all over the country and around 5,000 new wells continue to be added every year.

The project continued even during years of extreme drought. It was discovered that families took it upon themselves to follow the water table down by deepening their wells. They also imposed self-rationing. In this way they survived the droughts. In fact one of the best things you can do in a drought year is to dig wells. When the drought is over and the water table returns to normal levels a very effective well with deep water will be the reward. However, during those same drought years when the water-table dropped, there was little if any evidence of communal wells being deepened.

Rural Clinics situated in areas where there is a widespread coverage of such Family Wells and in which Community Health Clubs (Refer 4.4) have been functioning, have ***statistical records indicating reductions in water-related diseases of over 60%*** since the start of the project.

In Zimbabwe, the digging of wells is considerably more difficult than in Sierra Leone because of the rocky ground conditions and the water table tending to be much deeper.

Detailed construction manuals for the Upgraded Family Well are available.

Some important factors for the success of the project include:

- ***Private ownership*** of the water-point by the family;
- ***Ease of maintenance*** of the windlass;
- ***Security*** *by being able to have a lockable lid;*
- ***Proximity*** of the well to the family home;
- ***Productive use of water*** through vegetable gardening near the well;
- ***Improved nutrition*** for the family;
- ***Supplementary family income opportunities*** through the sale of vegetables.

The above are all contributory factors that have led to the incredible uptake of this Upgraded Family Well programme. In addition, many rural communities, who have begun to feel more and more vulnerable at having

to depend solely on modern hand-pumps, have turned to the Upgraded Family Well which they can confidently manage themselves.

It is also interesting to observe that the GoZ was at first very negative about the Upgraded Family Well and Windlass approach. They felt it was taking the country backwards in terms of development because it uses such a very "primitive technology" and they justifiably felt proud and patriotic about their Bush-Pumps. The Ministry of Health at one time even tried to halt the project.

However in 1998, GoZ did a complete U-turn and classified the Upgraded Family Well with windlass as being ***the first choice among technology options*** for Zimbabwe and one which should be promoted wherever ground conditions permit.

Brick-lined Family Well

Even a young child can lift water using a windlass
(The pulley-system is far too heavy for children)

3. RURAL SANITATION

3.1 Technological Failures

At least 90% of all latrines inspected under this evaluation have either already collapsed or are likely to collapse within 1-5 years of construction.

There are two important aspects to consider:

(i) The latrine designs that have been promoted by GoSL during the past fifteen years have obviously been failing since the early years of the sanitation intervention. ***It is little wonder that only 8% of the rural population have access to sanitary facilities.***

(ii) Deep unlined pits ***may put at risk the ground-water*** on which a village depends for its "safe" drinking water supply.

3.2 Care's Sanitation Programme in Sierra Leone: 1986 - 1994

The GoSL's Sanitation Programme kicked off with the VIP (Ventilated Improved Pit) latrine which was "imported" direct from Zimbabwe in the mid 1980s. Most VIP latrines tended to be heavily subsidised by the various NGOs involved in the programme. Subsidies included provision of cement not only of the latrine slabs but also for the very heavy super-structures with vent pipes. Hinged doors were also sometimes provided.

After 1991, Care placed much greater emphasis on some form of participatory Health Education followed by the provision of latrine slabs only. The rest of the construction to be undertaken by the householder (80% contribution). The idea of latrines being fitted with vent pipes was also dropped because it was believed that these contributed to the excessive weight of the superstructure which ultimately led to the inevitable collapse of the latrines within such a short period and anyway it was realised that the vent pipe rarely worked in SL.

A "disappearing" VIP

Last remains of aVIP

Since that time, 1991 until to-date, there has been little if any significant change in design or approach.

The initial problem appears to have been caused right at the very start when the VIP latrine design was simply "imported" into the Sierra Leone sanitation programme by the GoSL. This Zimbabwean design is entirely unsuitable for this country. So many factors are different.

An inspection of these differences may help us to find a way forward as clearly the present designs are failing and have been for many years:

3.3 The "Imported" VIP Latrine

(i) Latrine pit contents in Eastern and Southern Africa tend to be much drier and bulkier than in SL because newspapers, leaves, stones, maize cobs etc. are used for anal cleansing. However in SL and other West African countries, thanks to the Muslim influence, ***the preferred and apparently universal method of anal cleansing is the use of water which immediately changes the whole equation.***

(ii) With so much less unnecessary dry bulking taking place, plus the addition of water, which keeps the contents moist, ideal conditions are quickly achieved for ***natural bio-digestion*** of the pit contents to rapidly take place. This is particularly the case in a hot and humid country like Sierra Leone. Aerobic and anaerobic digestion quickly sets in (just as it does in a septic tank) and the pit contents (the sludge) will take a considerable amount of time to build up.

A very shallow, lined pit (perhaps as little as 0.5 meter deep) will serve the purpose perfectly well. It has thus been totally unnecessary all these years to dig pits anything like 3 meters deep, as has been the norm. Such deep pits will never, ever fill, even assuming that they do not collapse first!

(iii) In Zimbabwe, where the design of the VIP first originated in 1972/73, an unlined pit 3 meters deep was the norm. However, by 1984, it was discovered that many latrines were collapsing and that it was a false economy to build a nice ventilated superstructure on a pit that would eventually cave in. It was at this stage that MoH ruled that all VIPs should first have ***fully lined pits***, provided by the householder, before they could receive any cement subsidy for the construction of the slab and superstructure.

This was a decision taken in a country where the ground consists of hard, red, lateritic soils, which would normally be expected to be quite stable. However when it was observed that pits were collapsing never the less, the decision requiring pit linings (from top to bottom) was taken. By contrast, most ground conditions observed in SL tend to

indicate much softer, sandier, less stable ground conditions, which are likely to collapse soon after a pit starts to be used, as has indeed been the case.

It is strange that although the VIP design was "imported" into Sierra Leone in 1986/87 this crucial experience from Zimbabwe of frequent pit collapse and the remedial action that had by then been taken in that country, was not followed here.

(iv) In Zimbabwe, households tend to live quite far apart and rarely in the village setting as we find here in SL. The vegetation is open savannah for the most part and it does not have the lush dense bush and forest conditions of this country. For a VIP to function properly it needs to be out in the open so that any light breeze across the top of the vent pipe and into the open doorway will cause an updraft to remove odours. In addition, the top of the vent pipe, which should be fitted with a stainless steel fly-screen to help control flies, must be open to the sky. There should be no overhanging trees to block out the light that attracts flies up from the pit contents they have been feeding on and laying eggs in. The light shining in from the top of the vent pipe attracts the flies to their death by dehydration as they try to fly out of the vent pipe and are trapped by the gauze.

Because the vegetation in SL is so totally different, most of the design attributes of the Zimbabwean VIP latrine are made hopelessly ineffective in this country.

(v) In Zimbabwe, local brick making, using clay bricks that are first sun-dried and then baked in wood-fired kilns, is a widespread technology that has spread to most corners of the country. It is therefore fairly straightforward for households to produce the bricks for lining their pits and building their latrines. In SL, kiln-fired bricks do not appear to be very common and suitable lining materials for pits would appear to be difficult to come by. This factor would obviously have played a major part in the general reluctance to line pits. Sun-dried mud bricks are fine for the superstructure but quite unsuitable for the sub-structure.

3.4. Latrine Design in Sierra Leone : 1995 - 2000

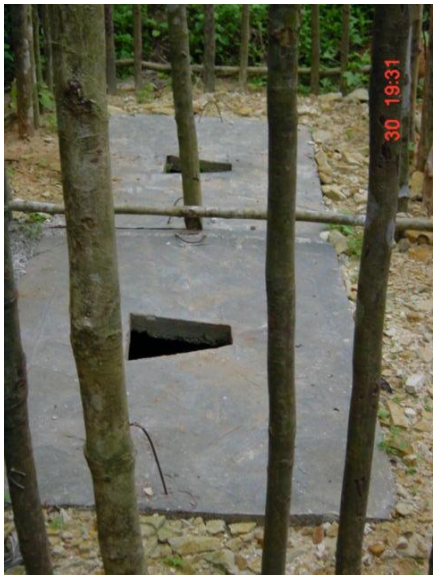
When it was finally realised that the vent-pipe was unsuitable for SL, the emphasis of the programme changed to that of providing one very heavy reinforced concrete slabs (1.5m x 1.1m and 100mm thick). The family was expected to place this slab over an unlined pit, at least 3 meters deep, and then construct a super-structure using traditional building methods similar to those used for constructing their houses.

However, even without the heavy concrete-block vent pipe in place, the latrines continued falling into their unlined deep pits just as they always have done in the past and just as they continue to do today.

3.5 Current Larine Construction Process

Care's Technical Staff train local builders, who are recruited from within their respective villages, on how to cast the latrine slabs. These "village" builders expect to get paid by each householder for every slab that is cast. Wooden form-work is provided for the slab as well as a wooden mould to form the drop-hole. One bag of cement and a 5mm diameter length (12m) of steel reinforcing is also provided in order to construct each slab.

Casting a 100mm thick reinforced slab



Heavy slabs positioned over unlined pits.

Note the very large drop-holes. Most mothers will not allow their young children to use such latrines for fear of them falling in which is certainly a risk.

There are a number of aspects about the slab design that should be considered even before analysing the "logic" of placing such a slab over a pit into which it will soon disappear without trace.

(i) The slabs are over-designed, and hence unnecessarily expensive, for the loading they will ever have to bear, even assuming the pit does not collapse and they have a long life;

(ii) As such, these unnecessarily heavy slabs are very difficult to carry into place over the pits and they dramatically increase the inevitability of the sides of the pit eventually caving in under their weight;

(iii) A proper design for the shape of the drop-hole is obviously a crucial aspect for all types of latrine. However, it appears that very little attention to the provision of a suitable, ergonomically designed mould required to form this opening has ever been given. As such, inappropriate opening shapes and sizes are apparent in every single latrine that we inspected. The openings are usually far too large and quite difficult to use and young children could fit through them. As a

result, many mothers who we interviewed explained that they would not allow their young children under 5 or 6 years of age, to use the latrines. ***As with children who are not allowed to collect water from the village wells, the fact that children under five years of age are seldom allowed to use the latrines brings into question the appropriateness of the intervention itself***.

(iv) A key-hole shaped design is the most appropriate. Such a design has proved safe, even for very young children of 2 or 3 years of age, to use. Simple moulds in plastic or steel are preferred as they can be reused many times.

Typical scenes of latrine collapse into unlined pits

3.6 A WAY FORWARD IN LATRINE CONSTRUCTION

3.6.1 Structured Participatory Health Education

Before going on to discuss the "way forward" and the adoption of more appropriate latrine designs, it is important to stress that it is imperative to ***precede any and every sanitation intervention with a structured and participatory, health education process***.

Only when the local villagers have a deep grasp and understanding of the need for them to have improved sanitary facilities and they have developed a community ("common unity") sense of purpose, through knowledge and understanding, will there be any point in continuing with a sanitary intervention.

No hardware subsidisation for a sanitary programme should ever be allowed to commence until a ***genuine demand for improved sanitary facilities*** is forthcoming from the community. The process of the structured participatory health education process is covered in more detail under the chapter on Health and Hygiene Education that follows.

3.6.2 Cat Sanitation

As soon as improved hygiene practice is properly understood by the local "***community***" (as defined more fully in the Health Education chapter), it is almost inevitable that noticeable health benefits will soon follow. Such communities will almost inevitably start moving up the Sanitation Ladder without the need for much prompting or external support.

One of the first things to be noticed will be that the Community will initiate "***Cat Sanitation***" themselves. This involves nothing more than taking a hoe or other locally available farm implement and burying faeces after every "sitting". Mothers should do the same for their young children. This is particularly relevant in farming communities (most of Africa) where people are out in the fields all day and far away from their domestic latrines. There is little point in going to all the trouble of building wonderful sanitation facilities near the home if there is a lack of personal hygiene awareness and subsequent remedial action taken out in the fields.

3.6.3 Hand-Washing

It is vital that the Cat Method should also be accompanied by ***hand washing*** (ideally with soap) after every occasion. This is by no means just wishful thinking…if a successful health education campaign, which is structured and fully participatory and inclusive, is carried out,

then such behaviour change is almost guaranteed. ***"Behaviour change***" should be used as an "***indicator***" of a successful Health Education campaign before any further support for sanitation is forthcoming.

Such a fundamental behaviour change, which is achieved through adoption of the Cat Method together with hand washing is, from the point of view of improving the health of the nation, the quantum leap we are all striving for. As soon as faeces are adequately buried and hands are properly washed after every visit, then a successful sanitation strategy can justifiably be said to be falling into place.

After the Cat Method and hand washing are accepted as being up on the first rung of the Sanitation Ladder, latrines, whether just simple basic pits or advanced (top of the Ladder) pour-flush latrines and WCs, will add very little more from a health perspective. Of course, latrines may well add convenience and comfort to the user, but in terms of health they will be adding hardly any benefit to what has already been achieved through the Cat Method and the all-important matter of hand washing.

3.7 Alternative Latrine Options

As soon as a genuine demand for improved sanitary facilities is forthcoming from communities, a number of technical options should be presented to them. These should be piloted in various villages so that the villagers themselves can form value judgements as to how they want to proceed and what technology choice they will opt for. ***Such "field-trials" are also vital in order to establish more accurate design parameters especially those that relate to number of users per latrine and filling rates etc***.

The ***super-structures*** for the latrines should continue to be built by the householders using well-understood, local house-building techniques and local materials.

There appear to be three basic choices of ***sub-structure*** for rural Sierra Leoneans to choose from as set out below:

A. ***Single Pit Latrine***: A single, shallow (0.5m deep), fully-lined pit with a lightweight slab that can be readily removed whenever the pit fills up so that the pit contents can be emptied out;

B. ***Compost Pit Latrine***: Two, shallow (both 0.5m deep), fully-lined pits and only <u>one</u> lightweight slab. Topsoil and ash are added to the pit contents of the first pit (the one being used with the slab) every day. As soon as it is full the slab is moved to the second lined pit, which is then used and the first pit, after being covered with more topsoil, is left untouched. After a minimum of three months retention, the contents of the first pit will have

been transformed into a valuable, humus-rich compost, which can be emptied and used in the vegetable garden. The first pit is then re-used and the cycle is repeated indefinitely. Although helminths and ascaris cysts may remain viable for up to a year, recent research seems to indicate that such risks are relatively minor especially when seen in the context of the general prevailing environment under consideration.

C. ***Pour-Flush Toilet***: A simple, small septic tank (approx. $1m^3$) is fitted with a pour-flush slab. A pipe is connected to this pit which then leads away to a convenient soakaway. Several pits can be connected to the same soakaway.

3.7.1 A: Single-Pit Latrine

Advantages:

(i) The pit is shallow and thus very ***easy and quick to excavate***. It should be circular and only about 500-600 mm deep. It should be fully lined with interlocking, trapezoidal shaped blocks to create an internal diameter to the pit of 600mm. The ***circular shape*** provides intrinsic strength (much more than the three-meter deep rectangular pits).

(ii) The pit will ***never collapse*** thanks to the lining and, because it can be emptied, the sub-structure and slab should ***last for decades***.

(iii) It is ***economical***: one bag of cement will be quite sufficient to provide a sufficient number of interlocking blocks for the circular pit lining plus extra to cast a slab 50mm thick and 1.2m in diameter. The fact that the pit is so shallow will help overcome any unnecessary fear that the slab may be perceived as being too thin (50mm).

(iv) A steel ***mould*** for the interlocking blocks is quite simple and can be ***fabricated in-country***. One mould should be provided to every village.

(v) A steel or plastic mould for the ***key-hole shaped drop-hole*** should also be provided to every village.

(vi) The ***householder*** can readily be instructed how to make the interlocking ***blocks*** as well as the ***cover slab*** with drop-hole.

(vii) The ***householder***, using traditional building techniques, can also construct the ***super-structure***.

(viii) ***No payments*** need to be made to specially trained local builders because the householder can quite easily, after a little training and demonstration, undertake the building of the complete structure, both above and below ground. This should increase acceptance of this design as it is so much less expensive.

(ix) The ***light cover slab is easy to lift off*** when the pit is full. As the pit is shallow it is easy to scoop out the contents and remove them to a convenient pit some distance away where they should be buried for at least three months. The contents can later be dug out of this second disposal pit, as they will by then have been transformed into valuable compost.

(x) ***Risk of ground-water contamination is considerably reduced*** because the pit is so shallow.

Disadvantages (Single-Pit Latrine):

(i) ***More odour from pit contents*** is likely than from the Compost-Pit Latrines although this can certainly be overcome if top-soil and ash is also added daily. It will be important to use a cover over the drop-hole to control odours as well as flies.

(ii) The task of emptying the pit will be made less pleasant by the fact that the contents are still ***partially fresh***.

(iii) This process requires "***double-handling***" of the contents if the compost product is to be used on vegetables, fruit trees, wood lots, flowers or whatever.

3.7.2 B. Compost-Pit Latrine

Advantages:

(i) Virtually all of the Advantages listed above for the Single-Pit Latrine.

(ii) As topsoil and ash are added to the contents every day, there should be ***far fewer odours and greater fly control***. However it would still be preferable to use a cover over the drop-hole.

(iii) The pit contents will NOT require to be removed until they have already turned into compost (after 3 months) by which time the ***contents will have become an odourless, friable, humus and relatively easy to handle***. The task of emptying the pit will therefore not be too onerous and the contents can be shifted directly to the point of usage.

(iv) ***The whole emphasis with the Compost Latrine is to change what is traditionally understood to be a dangerous WASTE material into a useful RESOURCE with a real value (something the Chinese have clearly understood for many hundreds of years). It is a matter of trying to develop a fresh appreciation of the wonders of human excreta!***

- ***every adult can produce enough fertiliser to grow their own food;***
- ***urine produced by one adult in a year provides enough fertiliser to grow 250 kgs of grain.***

Dr Stephen Esrey, UNICEF, New York, 1997)

Disadvantages of Compost-Pit Latrine:

(i) The requirement for an additional pit and the cost of an ***extra half-bag of cement*** for the lining;

(ii) A ***larger superstructure*** to accommodate the two pits is required, or alternatively, two separate super-structures, one for each pit, will be used alternately.

3.7.3 C. Pour-Flush Toilet

Advantages:

(i) This is a technology near the ***top of the Sanitation Ladder.***

(ii) The pit contents are kept ***odourless*** (as a result of the water seal);

(iii) As long as the pan is kept clean then ***fly control*** is assured;

(iv) Some of the advantages listed under Single-Pit Latrine above:

- ***easy and quick to excavate*** shallow pit;
- pit will never collapse and the sub-structure should ***last for decades***;
- super-structure can be built by householder;

(v) ***Risk of ground-water contamination can be completely removed*** if the effluent is piped a safe distance away from any nearby wells or water sources.

(vi) ***No contact with pit contents*** needs to ever take place.

(vii) A very much ***higher concentration of latrines*** can be considered where houses in a village are congested or where space for constructing many pit latrines becomes a problem. This is particularly the case in high-density villages and even towns.

(viii) Pour-flush Latrines can be ***constructed within the house*** adding to convenience and security.

Disadvantages:

(i) ***Larger quantities of water*** are required in order to operate a pour-flush system efficiently;

(ii) ***No benefits of excreta converting from a "waste" into a "resource***" are gained (as with the compost latrines);

(iii) ***More expensive to construct***: A trained builder will require payment to construct the septic tank, the pour-flush slab and to install the sewer-pipes. In addition, a more expensive mould will be required to form the pan with water-seal;

(iv) ***PVC pipes*** will be required to lead away the sewerage to the soakaway and about ***three bags of cement*** will be required to construct the tank-like sub-structure and pour-flush slab;

(v) A simple rock-filled ***soakaway*** also needs to be constructed;

3.8 Hand-Washing Tanks

A discussion on sanitation would not be complete without mentioning the vital need for a convenient hand-washing tank, which should be positioned near every household latrine, together with a piece of soap.

Villagers themselves, with a little training, can quite easily construct extremely durable and inexpensive tanks complete with "taps". River sand and one shovel of cement (about one-eighth of a bag) is all that is required to construct a 10 litre tank.

The "tap" is made with a short length (75mm) of thin brass tubing (costing about 25 US cents) which the householder should be provided with. Alternatively the casing of old Bic ballpoint pens can be turned into perfectly acceptable "taps" although not as durable as the brass because the plastic will deteriorate in the sun.

Either one of these tubes is first inserted through the side of the tank, near the bottom, when the cement and river-sand mortar is still quite soft. Once the tank has completely cured it is placed on a pedestal outside the latrine. A small stick or carved piece of rubber from an old car tyre is all that is needed to close the tap by inserting the sharp end into the tube! The householder has thus provided the family with a perfectly acceptable and long lasting hand-washing facility.

The production of such hand-washing tanks has been found to be a very useful income generating project in some communities, particularly amongst women's groups who produce the tanks for the whole village as well as those near by.

Finally, it is often a good idea to establish a very reliable "indicator" so as to be able to gauge whether the hand-washing tanks are in fact being used and not simply being filled up quickly when the Monitoring Teams are seen heading down the road to inspect "their" sanitation programmes! To achieve this, families are advised that rather than allow the water to go to waste when it flows out as hands are being washed, they should plant some flowers or herbs or whatever immediately below the tap so as to benefit from the waste water. If the plant is thriving when the Monitors show up then they can be pretty certain that the facility is indeed being used. However, the nicest indicator is to find a well-used piece of soap placed next to the tank.

Moyamba children collecting water from traditional open well

4. HEALTH AND HYGIENE EDUCATION

4.1 Background

During the latter half of the UN Water Decade of the 1980s, the realisation slowly spread through the Sector that the provision of water and sanitation facilities within rural settings did not in themselves achieve the health improvements that had originally been anticipated. There was a growing awareness that a vital component had been missing in most programmes, that of Health Education.

By the early 1990s most programmes had started initiating some sort of Health Education component but it was generally pretty ineffective and more of an add-on to the goal-oriented hardware aspects of any water and sanitation project. Usually only a small proportion of project funds were allocated to this "new" activity. As a result, very few improvements, if any, were observed when it came to positive behaviour changes and health benefits amongst rural communities. It was realised that in fact this health education business was far more complex than originally thought.

Various different approaches were then tried: from the very prescriptive to the more participatory. In general, the more participatory the process became, the better were the results. This led to a whole flurry of PRA (Participatory Rural Appraisal) processes being developed with various acronyms like PHAST, SARAR etc. All the methods basically had the same idea: the active involvement of communities in identifying and analysing their own problems was a vital part of the process in order to come up with practical "home grown" solutions for tackling them.

Participatory educational training tools, which were specific to local ethnic groups and conditions, were developed in various countries. Such training materials tended to be graphic in nature so as to be "read" by illiterate or semi-literate people with little or no schooling.

4.2 Care's Health Education Programme in Sierra Leone

Meaningful attempts at introducing Health Education into Care WatSan projects commenced around 1990 when Bud Crandall introduced a carefully thought out participatory training programme consisting of nine topics :

(i) Sickness from Water
(ii) Protect Household Compound from Human Faecal Contamination
(iii) Hand-washing
(iv) Diarrhoea and Dehydration (causes and treatment)
(v) Sanitary Protection of Food
(vi) Child Nutrition and Immunisation
(vii) Sanitary Care of Household Drinking Water
(viii) Sanitation at the Farm
(ix) Intestinal Worms (Helminths)

However the timing for this intervention was unfortunate in that it coincided with the start of 10 years of conflict and upheaval in this country. Effective Health and Hygiene Education that leads to positive behaviour change and improvements in preventative health, is a fairly slow and complex process and requires a considerable amount of time and consistent effort. Most successful projects in other countries have demonstrated the need to engage with rural communities for at least five years and preferably even longer. This simply has not been possible in Sierra Leone over the past decade despite all of Care's really admirable efforts in trying to continue operations under such dangerous and chaotic conditions.

Moyamba Community Action for Health (MOCAH) project was an innovative community-level service and mobilisation project using an integration of community-managed health promotion activities and technical assistance for provision of clean water supplies and adequate sanitation facilities. This project was very well planned and had the makings of becoming a successful project, if only it had been allowed to take off. However Moyamba district, where Care had focused most attention since 1980, became one of the most unstable parts of the country and by 1994 the whole operation had to close down.

Care staff had to relocate to other parts of the country like Makeni, Port Loko and finally the Western Peninsular. In Timdale Chiefdom, Moyamba district, health education activities actually got started in 1994, then had to be abandoned in 1995 because of increased insecurity. Some Care staff even had to run for their lives and hide in the forest with local villagers. Vehicles were hijacked, offices were looted etc. Not a good situation for a sustainable development project and the whole Moyamba area had to be abandoned for several years. It was only re-started again in 1999. However, activities were again halted earlier this year because of lack of funding.

> ***Such geographical disruption to Care's activities combined with uncertain funding made it almost impossible to implement effective projects, particularly with regards to Health Education.***

Most of Care's WatSan projects over the past decade have been forced to become Emergency in nature. They have not been able to encompass the methodical, time consuming business of long-term sustainable development initiatives. Everyone hopes and prays that this war-like situation is coming to an end and that with prospects of peace returning to the country, there is at long last the possibility that a more favourable climate will prevail for long-term development initiatives to take root.

In light of the prevailing circumstances as described above, it is quite understandable that in most cases, wherever health education sessions have been able to take place at all, they appear to have been fairly "prescriptive" in nature with limited results (as was the case the world-over during the mid '80s as referred to above). If an EHTA trainer spends a morning in a village and talks about health related matters and, before he or she departs, hangs up a few

posters, as has tended to be the case, this approach is quite obviously not going to succeed. This was perfectly evident in virtually every village that was inspected during this evaluation exercise.

We established that in most cases, whenever people in a village are questioned about matters relating to health and hygiene, they were likely to come up with the correct answers. However, Knowledge, Attitudes and Practices (KAP) can each be very different. For example, most people already know about the dangers of smoking or of promiscuous sex but this does not necessarily mean that they want to change their life-styles for the better.

Health related issues such as hand-washing or latrine building must be viewed in the Sierra Leonean context against the backdrop of blood-thirsty mayhem and anarchy of the past few years. Is only then understandable that achievements in this area have been disappointing so far.

Clearly there is a desperate need for Sierra Leone to try and make up for lost time by embarking on a major health and hygiene education campaign. UNICEF now estimates that ***one-third of all Sierra Leonean children will die*** before they reach five years of age, the highest such statistic in the world (BBC, 12/12/00).

There is also increasing evidence of the enormous benefits that can be achieved if attention is given to "***early child development***", particularly before the age of three. Such efforts have been shown to lead to higher levels of understanding and intelligence as children grow into adults and, UNICEF asserts, is likely to have a positive impact on improving a country's economic and social development.

4.3 Health Education as an Entry Point for Development

- All mothers have a natural interest in learning how to improve their children's health and well-being and readily join Health Clubs (Refer 4.4). They are usually starved of ***intellectual stimulation*** in the rural areas and really appreciate the mental stimulus that such a process entails.

- A Health Education Course develops a common bond between members and ***a shared understanding*** of health issues, which lead to common targets of hygiene and self-improvement.

- To be pro-active, rural householders usually prefer a consensus of the majority in order to feel ***confident about behavioural change*** relating to hygiene.

- Because it is an academic exercise, health education ***does not involve material gain***. Consequently there is rarely any of the competitive jealousy that can often destroy projects where individuals stand to profit.

- A regular period together gives members a chance to ***get to know each other and identify their own leaders*** so that when implementation begins there is a solid basis for development.

- This strategy works on the basis that "***little and often***" produces more understanding than "***one large dose***" of health promotion. By revisiting topics every week, a consensus is formed that welds together a collection of householders with a ***genuine "common unity" of purpose;*** i.e. a **Community** has now been established in the true sense of the word.

The use of the word "community", which one finds in almost every project document, is quite misleading. To simply presume that because a number of households happen to be living in reasonable proximity to each other and that they will have formed themselves into a "community" is almost as naïve as to assume that the various people living in a high-rise apartment-block in New York or London even speak to each other, let alone can be considered to be "a community".

A community (as defined above as "common-unity" of purpose), needs time to be deliberately established and nurtured. One example of such is the "Secret Society" that most rural women in Sierra Leone belong to. These have powerful (and painful) initiation rights which develop a very strong sense of bonding. This "bonding" has greatly helped women to cope with so much adversity in their lives.

Another highly successful approach, which is not limited exclusively to women, is the Community Health Club as described below. When a committed group of people has been making the effort to meet up every week for about six months in order to discuss and analyse issues that directly impact on their lives, another amazing bonding process begins to take place. Genuine leaders will soon emerge as part of a natural, democratic process within the group (or Health Club). When it comes time to implement the hardware aspects of any water and sanitation project, or almost any other type of project for that matter (e.g. the ***Smart Seed Project***), such leadership will certainly prove itself invaluable. It should be given a leading role to play in all such local, broad-based, development initiatives.

Health Clubs have proven to be effective at instilling a strong "culture of cleanliness" into a village community.

4.4 "Health Clubs": A New Approach to Poverty Reduction

- A ***Community Health Club*** is a voluntary association of people from the same area who gather regularly with a ***shared ethos of self improvement and the goal of upgrading family living standards***.

- The "Club" is open to men and women, young and old, with no entry requirements or joining fee.

- It is a non-exclusive organisation of between 50 and 150 members representing most households in a village.

- Each member is issued with a membership card that outlines the content of the health education training, which consists of 24 sessions. These are facilitated by the VDP (Village Development Promoter) for the area.

- This card is a form of social ***contract between the community and the VDP***, committing both to attend regularly.

- They are called "Clubs" because they usually meet once a week to pursue health objectives, either in the training programme or later to implement the "***practical steps to good health***".

- Once health issues are well understood, a group decision is made which binds all the members to a ***common objective***.

- This "Group identity" helps them to implement projects easily as ***peer pressure*** is more effective than the top-down directives of project planners.

- Members encourage each other's ***home improvement*** efforts and compete to be the best. They conduct home visits that help identify areas of improvement in home hygiene as well as actively monitoring the health of everyone in the area.

- This is ***true empowerment of the community***, as all planning for water and sanitation, or any other development project in the village, (e.g. construction of a School), takes place through the VDC (Village Development Committee). This Committee would normally be made up of many of the leading Health Club members enabling it to become ***a sustainable and self-reliant grass roots organisation.***

4.5 Applied Health Education and Development (AHEAD)

As discussed above, the promotion of health using participatory training techniques has been popular for the past decade. However the AHEAD methodology takes this a step further to a more systematic programme of "***structured participation***" which combines participatory activities within on-going women's groups. This is ***a strategy that builds and empowers a community, so that it is equipped to solve its own problems***. This is not just a theory but a highly effective implementation model for mobilising rural householders into genuine "communities", with the capacity to manage and sustain effective water and sanitation, as well as other, development projects.

The ***AHEAD methodology is a*** "***process of development***" through which projects are carried out according to a **Four Phase Programme**, as explained below, which should be implemented over a four year period.

4.5.1 Phase 1: Health Knowledge and Hygiene Promotion

An intensive Health Education Phase must take place before the start of any implementation activities. This involves the formation of Community Health Clubs (CHCs), which are dedicated to attending weekly training sessions on health issues over a six-month period. Trained extension staff facilitate the establishment of the Health Clubs and all the training sessions.

In Care's case these extension staff could be the existing EHTAs (Environmental Health Technical Assistants). However, much better would be the establishment of an entirely new cadre of extension staff called something like VDPs (Village Development Promoters). As will be seen below, we should really be looking at a much more ***holistic model*** for village development and this will require field workers who have a broad spectrum of development training.

One EHTA or VDP should be able to cover at least five villages at a time. Thus in a year, with two six-month training cycles, ten villages should be covered. However, sometimes a village may be large or perhaps the initial interest in joining the Health Clubs may not have been widespread. In such situations it may well be necessary to provide a second round of training in that same village so as to cover those "laggards" who only decide to join the Clubs later, once they have appreciated what they were missing out on the first time round.

Club members are expected to attend at least 80% of the 24 Health Education sessions (held over a six-month period). Each time they attend a session, their ***Club Membership Card*** should be signed off against the topic that was covered that day by the VDP. Once all topics have been covered a special Graduation Ceremony is arranged. All those members who qualified (by attending at least 80% of the sessions) will receive a glossy ***Certificate***. This is usually a memorable and very festive occasion. For most villagers, it will be the very first time in their lives that some recognition is given to their attainment of an intellectual pursuit. It is heart rending to see the joy most old women display when they proudly walk back to their families with their hard-earned Certificate, which will probably be framed and placed in a prominent place in their homes.

There is also a rather cunning safeguard for accountability in this process. Just as each CHC member has his or her card signed off and dated against the relevant topic; so too the VDPs card must also be signed off and dated by the Club Chairperson or Treasurer. This is to ensure that both sides are keeping to their social contract, which

committed them at the beginning to complete the whole course. The VDP will only receive his or her allowance if proof of "doing the job" can thus be demonstrated.

Once the process gets going it is highly unlikely that the Health Club members will cheat themselves by allowing a lazy VDP to get away with such behaviour for very long. In other words, the VDP will receive a just return for his or her own efforts. More Health Clubs being covered and more training sessions should equate with more reward. However job satisfaction also plays a very big part and it is unusual to find a VDP who is not as enthusiastic about the Clubs as the members themselves are.

4.5.2 Phase 2: Social Development

Part of the process of empowerment is to understand and assert one's rights and accept responsibilities as a wife or husband, child or parent, and as a member of society. Civic duties are a key component of a fully responsible member of society. Appropriate training materials have recently been developed to promote civic education in Community Health Clubs.

In the Sierra Leonean context, after all these years of civil conflict, a vital component of this Second Phase would be ***Conflict Resolution*** and other issues revolving round the ***Peace Process***.

4.5.3 Phase 3: Implementation Through Applied Information

The lessons learnt are applied in the form of 'home-work' at the end of each meeting. Members assist each other to easily achieve the recommended practices. These include ensuring that every home is clean, digging a refuse pit, constructing a pot rack and a hand-washing facility, properly covering drinking water containers and providing individual family cups, a nutrition garden and a fuel-wood lot.

Most Club members will identify a safe source of drinking water and a family latrine as being priorities. It is at this stage that the Project should be able to contribute towards ensuring that the community can be assisted to reach its goals of safe water and sanitation. The community should be requested to produce a ***Village Map*** indicating their existing sources of drinking water, other water sources, houses with latrines and those without. This is a vital part of the process as it will then lead to effective planning, by the community itself, when it comes time to selecting sites for new wells or household latrines. It will also provide the technical members of the project team with some of the information needed to assess the risks of ground-water contamination and what safeguards should be put in place. Most Health Clubs are usually keen to produce such maps on a large piece of

cloth with different coloured pieces sewn on or embroidered to demark the wells, houses, roads, streams etc.

4.5.4 Phase 4: <u>Self Reliance: Poverty Reduction & Skills Training</u>

> ***As poverty is the underlying cause of poor health, villagers, and particularly the women, should be trained in skills to help augment their family income and provide a budget that they themselves can control. This also helps cushion the financial impact of AIDS.***

In conformity with a ***more integrated and holistic approach to development***, it is important to see the previous three phases as being part of a bigger picture. These activities are part of a broader effort at the overall development of the communities, which we serve.

Over time, additional skills training should be provided to the communities. There is indeed an almost unlimited range of income generating activities that may be appropriate. Such skills training may include some of the following:

- Production of hand-washing tanks
- Soap and lotion making
- Mosquito-net making

- **Latrine construction**
- SSB (stabilised soil block) production for building houses (and latrines)
- Interlocking-blocks (for latrine linings & shallow wells)
- Fibre-cement roofing tiles

- **Upgraded Family and Village Wells**
- Well-Sinking
- Windlasses
- Bearings for Windlasses
- Tin well-lids
- Well-ropes and buckets (made from old car tyres)

- **Improved farming methods** (e.g. rice production)
- Oil pressing
- Fish processing
- Bee keeping
- Honey marketing
- Vegetable production
- Food processing (sun dried fruit)
- Poultry keeping
- Palm-wine production

- **Handcrafts**
- Dress making
- Pottery
- Paper making

The list is endless. The important thing is to make a start. It is usually a good idea to commence a project with those villages that are most likely to succeed quickly in this whole process and which will run with the opportunity. In other words those villages that are particularly "ripe for development". As soon as such villages are up and running they will usually provide ideal examples for other villages to imitate once they can see for themselves what can actually be achieved.

Families at last returning to Gondoma Village