An Evaluation Study of Operation & Maintenance of Afridev Hand-pumps installed under the Demonstration Phase of **RURAL WATER SUPPLY, SANITATION and HYGIENE EDUCATION PROJECT**

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Quetta - Pakistan
August 1991

UNICEF / LG&RDD / IRC

An Evaluation Study

on the Village Level of

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PREFACE

This study was carried out on request of IRC, International Water and Sanitation Centre, The Hague, The Netherlands. Its objective was to gather some basic information about the 125 hand-pumps installed in five districts of Balochistan by LG&RDD with the assistance of UNICEF.

The information in this report might be useful for the expansion phase in which many more hand-pumps will be installed.

Many people were of help in carrying out this study. LG&RDD officials, in Quetta as well as in the districts have been of great help. The same is true for the people working in the UNICEF office.

Most of all, I want to thank the three interpreters Mr. Allah Bakhsh, Mr. Zaher and Mr. Nawaz who assisted me during the study. Their assistance has been of great help to me.

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Chapter 1
INTRODUCTION

This report intends to describe the results of a short hand-pump study carried out during the months of July and August 1991. The study aimed at finding out the general condition of 125 hand-pumps installed in five districts of Balochistan, Pakistan by Local Government and Rural Development Department (LG&RDD), from now onward called LG, through the assistance of UNICEF. All these hand-pumps have been installed in the so-called Demonstration Phase which aims at preparing LG officials, UNICEF employees and the village people of these five districts for the next phase. In this expansion phase the five districts (Kharan, Chagai, Zhob, Loralai and Killa Saifullah) will be provided with fifty more pumps each. The programme will expand to several other districts of the province as well, namely to Khuzdar, Panjgur, Turbat and Pishin. A start with the expansion has already been made.

The study has been undertaken in order to let the results be of help for the on-going UNICEF supported programme activities.

The five districts of the demonstration phase lie within two ethnic areas. Kharan and Chagai are inhabited by Balochi (speaking Balochi and Brahvi languages). They both lie in the north-western part of Balochistan. Chagai bordering Afghanistan in the North and Kharan in the South. Both districts border Iran in the West. The area is drier than the other three districts situated in the north-eastern part of the province and trees are hardly to be seen at all. The other three districts Zhob, Loralai and Killa Saifullah are inhabited almost only by Pathans speaking Pushto. Although exception are there, these three districts have in general more water (natural springs, streams, karezes, etc) and some tree coverage.

Contents of this report

In Chapter 2 the Survey Methodology will be briefly explained. General Village Information - Chapter 3 - will mostly go into the total population and the number of visits paid by UNICEF and LG officials per village each.

The outcome of the Installation of the hand-pumps, Chapter 4, deals with the location of the hand-pump. It is examined whether the pumps are technically fit or not and the condition of its cemented parts are assessed, together with the drainage capability.

Chapter 5 deals with the functioning of the hand-pumps, the water discharge capacity of the hand-pumps, the daily water fluctuations and, finally, with the water availability throughout the year.

The outcome of the hygienic conditions around the hand-pumps, Chapter 6, assesses the risk of contamination of well water through the incidence of mud and/or animal dung.

In Chapter 7, it is set out what the Perceived Ownership of the hand-pump is, and whether there are any constraints for people to take water.

The Outcome of the Use of the Hand-pump and the Hand-pump Water, Chapter 8, shows who draws the water most of all, how many times per day per family water is drawn on average and whether people or animals use most of the water pumped.

Chapter 9, Impact of the Hand-pump - first of all provides information on the existing water sources before the installation of the hand-pumps took place. It is set out which major changes have come about according to the village people. It has also been examined if people saved time as a result of the installation and if yes, how they spent the time saved.

One question, not primarily impact related, has been included in chapter 9. It deals with the constraints the village people meet in daily life. They were asked to formulate their first- second- and third most important constraint.

In the last Chapter 10, Conclusions and Recommendations have been formulated. The recommendations will not only be derived from the information put together in the report. It is the special nature of the Terms of Reference that made the Conclusions violate commonly followed report writing rules.

In a separate annex the reader can find a list of all villages visited and a photograph of each hand-pump.

It is important to know that reporting and analyzing has been done district-wise in the case of Loralai (23 hand-pumps) and Zhob (15 hand-pumps). In the cases of Kharan and Chagai the districts have been split in two. In Kharan, nineteen hand-pumps are located in the Sandy Desert bordering Kharan proper. In Kharan (SD), the nineteen Sandy Desert pumps are meant.

In Kharan, Besima sub-division the remaining six pumps are situated and will be referred to as Kharan (B).

In Chagai district two sub-engineers are responsible for the hand-pumps. One for the hand-pumps which have been installed around Nushki (Chagai (N), thirteen hand-pumps) and the other one for those installed in Dalbandeen (Chagai (D), twelve hand-pumps).

Chapter 2
SURVEY METHODOLOGY

To collect the data required for this study, a questionnaire was made. A small set of questions for each and every issue concerned was set up. Most of the questions were closed although village people were always welcome and stimulated to engage themselves in a discussion-like-conversation. Through observation the quality of work, hygienic conditions around the pump and hydraulics was assessed. By means of a three litre bucket and a stop watch the water discharge was measured.

The survey population consisted of all village people in those villages where hand-pumps were installed during the demonstration phase of the programme. Frequent visits to LG office were made and discussions/conversations were held with officials concerned; the same was true for the UNICEF office and the people involved in the programme.

An effort was made to have some people interviewed at Public Health Engineering Department (PHED) as they implement water supply schemes and with Planning and Development Department. The purpose of such interviews was to find out to what extend coordination between the various water-supply programmes takes place. In spite of the visits and phone calls made to the Departments, the interviews could not take place.

Group interviews were conducted. For each village one questionnaire was filled out. In order to get an adequate sample per village an effort was made to talk at least between five to ten persons. In almost all cases, especially in Kharan and Chagai district, men were out for work.

A serious constraint formed the teams disability to obtain the opinion of the female population of the village. Only in Zhob and Loralai, when nobody else was available old women could be interviewed.

In the Baloch districts the Consultant visited all fifty hand-pumps and was assisted by a Baloch interpreter and the LG officials concerned. He however could not himself visit any of the pushtoon districts as Home Department did not allow any foreigner to visit them. This was due to the prevailing law and order situation.

As the deadline of the study was nearing steadily it was decided after consultation with UNICEF, to send Pakistan nationals to these districts. The Baloch interpreter who accompanied the Consultant to Kharan and Chagai went, along with a Pushtoon familiar with the area, to Zhob district. Another well experienced person left for Loralai district after having been, as much as was time-wise possible, prepared by the Consultant.

In Zhob district the team of two managed to visit fifteen hand-pumps only. The remaining ten could not possibly be visited. Most of them due to an extreme tense situation between two pushtoon sub-tribes who recently clashed. The authorities had arrested some members of the clashing parties resulting in a threat from their side that they would seize any Government official roaming around in their respective areas. Several of the pumps could not be visited as the road leading to them was impassable

due to heavy rainfall. This last reason was also the case for two not visited pumps in Loralai district.

Killa Saifullah district could not be visited because of transport problems. Due to the theft of the UNICEF provided vehicle no transport was available.
As a result of all the hand-pumps (125) which should have been surveyed 88 or 70.4% were visited.

Two constraints which have been mentioned here should not be under-estimated. Obtaining knowledge and understanding of what women think about the change a hand-pump has brought along is indispensable. It was however impossible to obtain such information. The same is true, although to a lesser extent, for the fact that Consultant could not visit two districts and was forced to pursue a contingency plan.

Chapter 3

GENERAL VILLAGE INFORMATION

Information about the total population is important gathering was it concerns one of the selection criteria used by UNICEF and LG. Following the criterion, a minimum of 200 users for each community hand-pump should be assured. For villages well over two hundred souls it might be difficult to assess if the minimum requirement is actually met unless the pump clearly cannot be freely used by others (e.g. if the handle is stored or chained, or if the hand-pump is installed on a difficultly accessible compound). In case of a population of less than two hundred, let alone of less than one hundred, it is, or seems at least much easier to assess the situation. The only difficulty might be unawareness of seasonable or temporary koochi (nomads) presence and/or people from other villages taking water from the pump. In general, however, one can assume that villages with a population under two hundred are chosen in violation with that criterion.

If there is a minimum of users, there ought to be a maximum as well. In the Programme PC-1, May, 1991, it is mentioned on page A6 that piped water, for which PHED is responsible, is said to be supplied to villages greater than 1000 people or village clusters greater than 1500 people.

In the Project Plan of Action (1991-1992) however piped water is said to be supplied for population ranging from 3000 to 5000 people. If the Project Plan of Action information is correct then there is no problem. However, if the Programme PC-1's information is right then PHED and UNICEF /LG&RDD may be at cross purposes as in the total population exceeds one thousand in several cases.

Table 1 : **Total Population**

Amount of people	*< 100*	*>100*	*>200*	*>500 <*	*>1000*	*Total*
Loralai	*6*	*8*	*8*	*-*	*1*	*23*
Zhob	*-*	*2*	*2*	*6*	*5*	*15*
Kharan (Sandy	*1*	*5*	*9*	*2*	*2*	*19*
Kharan (Besima)	*-*	*-*	*6*	*-*	*-*	*6*
Chagai (Nushki)	*1*	*3*	*7*	*2*	*-*	*13*
Chagai	*3*	*2*	*4*	*2*	*1*	*12*
Total	*11*	*20*	*36*	*12*	*9*	*88*
Percentages	*12.5*	*22.7*	*40.9*	*13.6*	*10.2*	*100*

From the above table it can be seen that the total population exceeds one thousand in 10.2 % of all the cases.

In Killi Daily Kalagan (Kharan (SD) No. 12) total population is 225 and PHED promised a water supply scheme. A study was carried out to assess whether the water required for a turbine was available. This example shows how necessary proper coordination is. While selecting the villages in Kharan (SD) the sub-engineer could not convince the village people to opt for a hand-pump as they believed their chances for obtaining a PHED provided water supply scheme would be nihil afterwards. Those villages all had more than two hundred inhabitants and hand-pump installation there would have been more justified than in the six villages (see table) where they in fact were installed.

If PHED was to stick to these rules in any case then the sub-engineer in question would not have found himself confronted with such a dilemma.

In most of the villages visited the total population ranges from 200 to 1000 (in 54.5 % of all cases) which is a positive point to stress.

In over 35 % of all villages visited the population was less than two hundred.

Loralai	:	14 of 23	=	60.8 %
Zhob	:	2 of 15	=	13.3 %
Kharan (SD)	:	6 of 19	=	31.5 %
Kharan (B)	:	------		
Chagai (N)	:	4 of 13	=	30.7 %
Chagai (D)	:	5 of 12	=	41.6 %

The fact that Loralai with 60.8 % stands head and shoulders above the others should not be immediately judged. The high incidence of ladies strictly observing purdah in Loralai might have been taken into consideration in the village selection process. Putting a lot of emphasis on the population size may be less justified in cases where socio-cultural constraints stand out. Installing a pump in a big village does not mean it will be used as much as when it is installed inside a compound or in between two near-by compounds in a smaller village. In case of strict purdah observance it is highly unlikely that a woman will be allowed or want to visit a hand-pump exposed to passers-by. In such a case, former sources of water with less risk of exposure will be preferred. This may well be the case in quite some villages falling in the categories with less than two hundred inhabitants. In Loralai women almost exclusively fetch the water.

In order to measure the contact between the village people and the LG and UNICEF officials, the number of visits these officials made to the villages was asked. Table 2 (next page) shows the results.

To avoid misunderstanding it should be noted that the questioning in Loralai has been slightly different. In all other districts visited, including those indispensable for the supervision of the pumps while being constructed, have been taken into account. In Loralai all visits were counted after the installation of the pumps in question had been already installed. Percentages and calculations do not therefore consider Loralai in this table.

Table 2

Number of visits paid to the villages by UNICEF and Local Government Department since the hand-pumps were installed during 1990

Number of visits by UNICEF and Local Government / *Districts*	*0*		*1*		*2*		*3*		*4*		*5*		*6*		*7*		*8*		*No answer*	
	L	*U*	*L*	*U*	*L*	*U*	*L*	*U*	*L*	*U*	*L*	*U*	*L*	*U*	*L*	*U*	*L*	*U*	*L*	*U*
Loralai	6	19	16	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zhob	-	4	-	4	1	4	1	2	5	1	1	-	3	-	-	-	4	-	-	-
Kharan (Sandy Desert)	_	15	1	3	2	1	2	-	5	-	2	-	2	-	-	-	4	-	1	-
Kharan (Besima)	-	4	-	-	1	1	2	-	1	-	-	-	1	-	-	-	-	-	1	1
Chagai (Nushki)	-	4	-	2	1	4	-	1	-	1	1	-	4	-	1	-	4	-	1	2
Chagai (Dalbandeen)	-	11	-	-	-	-	-	-	-	-	-	-	-	-	2	-	10	-	-	1
Total																				

From table 2 it becomes clear that many pumps (38 out of 65) were never visited by UNICEF representatives or as much as 58.5 %. One to two visits were made in 29.2 % (19) and three to four visits in 7.7 % (5) of all cases. Unknown or no answer was given four times (6.2 %).

In Kharan (SD) one can easily understand no visits have been made since installation in most of the cases (15 out of 19) as visiting them requires a real undertaking. As far as Chagai (D) is concerned one would not expect the prevailing figures (11 out of 12 pumps with even one "unknown", so maybe no visit at all was made). Eleven out of twelve pumps lie in the vicinity of the Nushki - Dalbandeen - Taftan highway and visiting all of them is a matter of two days only.

One third (33.8 %) of all pumps were visited by LG officials eight or more times. It was not considered just to exactly indicate the number of visits above eight as it would have distorted the whole picture. Pump number one in Chagai (N) is hardly ten minutes driving by car from the Nushki LG buildings and a minute or two from the Quetta-Zahedan highway junction. The fact that the sub-engineer in-charge paid over twenty visits does him credit but does not provide us with fair information if compared to difficultly accessible villages. Another extreme forms the single visit paid to pump number fifteen in Kharan (SD). The sub-engineer visited this village only once but stayed 10-days to supervise the entire construction process of the pump.

Chapter 4

INSTALLATION OF THE HAND-PUMPS

In the questionnaire used four questions were destined to gather information about the installation of the hand-pump.

The first question is concerned with the location of the pump. Pumps can be located central, central near or at the edge of the village. Furthermore pumps may have been installed inside compounds or near to places where women hesitate to go to, like near to a mosque.

The second question concerns the technical aspects of the pump: whether its technical quality is good or not. There is an overlap with the following chapter about the functioning of the hand-pumps.

The third question checks the condition of apron, slab, pedestal and drain.

The fourth and last question assessees whether the drainage is excellent, good, adequate or bad.

Table 3 : **Location of the Hand-pumps**

Pump location District	Central	Central Edge	Edge
Loralai	14	2	7
Zhob	4	2	9
Kharan (SD)	2	7	10
Kharan (B)	3	2	1
Chagai (N)	3	3	7
Chagai (D)	3	6	3
Total	29	22	37
Percentage	33	25	42

Table 3 shows that most of the hand-pumps (42.04 %) are installed at the edge of the village. What is not shown is that there is for instance a difference between the at-the-edge locations of Loralai/Zhob on the one hand and Kharan (SD)/Chagai (N) on the other hand. In the case of Loralai and Zhob the distance to the last houses is negligible as compared to the other two "sub-divisions".

In Loralai the average distance from the hand-pump to the houses located on the village boundary is less than ten metres. In Zhob just under fifteen metres and in both districts without any peaks worth speaking of. In Kharan (SD) four pumps are at 250 metres and above of which two are at a distance of one kilometre (on average at 638 metres). In Chagai (N) the distance of five at-the-edge hand-pumps averages 1180 metres. One pump lies at a distance of two and a half kilometre although a few huts, belonging to family members of the people living in the village in question, are situated near-by.

Almost a third of all pumps is centrally located, exactly a quarter at the central edge.

One hand-pump in Chagai (D) is situated within a compound not easily accessible for others at all. In Loralai four pumps are located within compounds as well although they should not be inflicted upon a similar judgement as in the case of Chagai (D). More information about this subject is given when the constraints to fetch water are being discussed.

Table 4 : **Technical quality of the pumps**

Is Quality of Pump good *District*	*Yes*	*No*	*No, but gives water*	*Total*
Loralai	*19*	*4*	-	*23*
Zhob	*10*	*1*	*4*	*15*
Kharan (SD)	*15*	*4*	-	*19*
Kharan (B)	*6*	-	-	*6*
Chagai (N)	*11*	*2*	-	*13*
Chagai (D)	*11*	*1*	-	*12*
Total	*72*	*12*	*4*	*88*
Percentage	*82*	*14*	*4*	*100*

Of all pumps installed during the year 1990 and visited during the short study - 88 in number - 12 (13.64 %) were technically not of good quality. Of these twelve eight (9.1 %) did not give any water. It means that 72 (81.8 %) hand-pumps were technically fit and that 80 (90.9 %) were giving water.

In Loralai four pumps were not functioning. One was allegedly damaged by Afghan refugees while the village people, who migrate in winter to Sindh, had left. Another one was damaged by children who filled it with stones. The third one was un-fit due to some unknown reason, the fourth and last one due to neglect.

In Zhob, five pumps were unfit of which four gave water. The following causes were given:

1. The foot valve was broken and repaired in an amateurish way instead of being replaced.

2. The screw thread of the nuts, keeping the upper part of the pump fixed to the pedestal, were stripped and now water leaks while the pump is in operation.

3. The suction pipes are not located deep enough below the water-table.

4. The discharge pipe is in bad shape.

5. The pipes are leaking.

In Kharan (SD), four pumps were technically unfit, none of them giving water. One due to excessive pipe leakage, another one because of a total collapse of the well, the third one due to neglect and the fourth one was allegedly damaged by a rival group in the village, not agreeing on the location of the pump. In this last case the pump hardly functioned for one week.

In Chagai (N), two pumps were out of order, both not giving water. One, in disrepair since two months, had broken rods. The other one along the highway had completely disappeared due to heavy rains or melting snow (or both).

In Chagai (D) one pump, number 6, was under repair on arrival there. The next day it was functioning again.

To gain a better understanding about Table 5, given on next page, it is necessary to know what excellent, good, adequate and bad stand for.

Excellent

An apron is called excellent if there is no risk of erosion around , if it is sloped so that all wastewater drains off and if there are no cracks or fissures. A well proportioned ridge and/or groove may help to call an apron excellent as well.
A slab is excellent when it rises well above the apron and when there are no cracks or fissures.

The same is true for the pedestal, but it should of course rise well above the slab.
A drain is excellent when all cement work is impeccable, when its length is more than two and a half meter and when it rises far enough above ground level so that no dirt is likely to cause pollution. The last requirement is particularly important when an animal drinking place is attached to the drain. It should be noted that the drain meant here is the one constructed by LG.

Good

An apron , slab, pedestal and drain are defined "good" if the workmanship could have been of higher standards. Still the work is more than acceptable. Around the apron risk of erosion is allowed as well as around the drain. A slope in the apron may be absent or almost non-existent.

Table 5 : **Condition and quality of the cemented parts of the pump**

	Excellent	*Good*	*Adequate*	*Bad*	*Missing*	*Total*
Loralai District						
Apron	*6*	*13*	*4*	-	-	
Slab	*5*	*15*	*2*	*1*	-	
Pedestal	*7*	*12*	*4*	-	-	
Drain	*1*	*9*	*4*	*9*	-	
Total	*19*	*49*	*14*	*10*	-	*92*
Percentage	*20.7*	*53.3*	*15.2*	*10.9*	-	*100*
Zhob District						
Apron	*9*	*3*	*2*	*1*	-	
Slab	*5*	*4*	*6*	-	-	
Pedestal	*14*	*1*	-	-	-	
Drain	*6*	-	*3*	*5*	*1*	
Total	*34*	*8*	*11*	*6*	*1*	*60*
Percentage	*56.7*	*13.3*	*18.3*	*10*	*1.7*	*100*
Kharan (SD)						
Apron	*3*	*15*	*1*	-	-	
Slab	-	*17*	*2*	-	-	
Pedestal	*1*	*17*	-	*1*	-	
Drain	*1*	*17*	*1*	-	-	
Total	*5*	*66*	*4*	*1*	-	*76*
Percentage	*6.6*	*86.8*	*5.2*	*1.3*	-	*100*
Kharan (B)						
Apron	_	*6*	-	-	-	
Slab	-	*6*	-	-	_	
Pedestal	-	*6*	-	-	-	
Drain	-	*6*	-	-	-	
Total	-	*24*	-	-	-	
Percentage	-	*100*	-	-	-	

	Excellent	*Good*	*Adequate*	*Bad*	*Missing*	*Total*
Chagai (N)						
Apron	-	*10*	*2*	-	*1*	
Slab	-	*4*	*7*	-	*2*	
Pedestal	-	*12*	-	-	*1*	
Drain	-	*10*	*2*	-	*1*	
Total	-	*36*	*11*	-	*5*	*52*
Percentage	-	*69.2*	*21.2*	-	*9.6*	*100*
Chagai (D)						
Apron	-	*10*	*2*	-	-	
Slab	-	*9*	*2*	*1*	-	
Pedestal	-	*12*	-	-	-	
Drain	-	*5*	*4*	*3*	-	
Total	-	*36*	*8*	*4*	-	*48*
Percentage	-	*75*	*16.7*	*8.3*	-	*100*

Adequate

Adequate is called anything that is still acceptable but could be much better. Cracks and fissures are there, a ridge or groove around the apron may be damaged somewhat. Erosion takes place but won't cause subsidence of apron or drain soon. The well functioning of the pump in its broadest sense isn't really at risk.

Bad

Bad is anything that doesn't fall in the other three categories. Bad is mentioned if the quality of the pump is really below standard.

There is a striking difference between the Loralai and Zhob tables on the one hand and all the others on the other hand. For the sake of the integrity of the data some healthy suspicion is justified here. In all other tables the value excellent is hardly to be seen whereas in the case of Loralai (20.7%) and Zhob (34%) this is all but the same. It is probably no coincidence that the Consultant didn't visit Loralai and Zhob district. The table provides however still some valuable information and, taking into account the good photographs of Zhob district, hand-pumps there may be in better shape after all.

In Loralai in nine out of all cases (23) the drain was called bad. This qualification was most of all given because of their modest length. Twenty to fifty centimetre length is not sufficient and the risk of pollution of the well is high. As compared to all government built drains, and especially to those of Kharan, the ones in Loralai are below standard.

In Chagai (N) the missing-column is not reflecting a "No Answer" reply. In one case (pump no. 6) the pedestal was attached to the apron without a slab in between. Pump number eleven has completely disappeared and couldn't therefore be assessed.

Drainage

For some reason people often confound the meaning of drain with that of drainage and vice versa. The drain assessment in table six shows the work performance of LG[1].

Table 6 : **Drainage**

	Excellent	*Good*	*Adequate*	*Bad*	*Missing*	*Total*
Loralai	*1*	*4*	*10*	*8*	-	*23*
Zhob	*5*	-	*3*	*7*	-	*15*
Kharan (SD)	-	*1*	*1*	*17*	-	*19*
Kharan (B)	-	*5*	-	*1*	-	*6*
Chagai (N)	*5*	*3*	*2*	*2*	*1*	*13*
Chagai (D)	*3*	*6*	*3*	-	-	*12*
Total	*14*	*19*	*19*	*35*	*1*	*88*
Percentage	*15.9*	*21.6*	*21.6*	*39.7*	*1.1*	*100*

Striking is the overall drainage performance as 35 out of 88 hand-pumps, or almost forty percent, have bad drainage. Although both Loralai and Zhob, respectively almost 30% and 50% of all cases in that bad category, the bad performance of Kharan (SD) sets them aside altogether (in Kharan (SD) drainage was bad in 90% of the cases). In Kharan as a whole the drains are long and strong ending in a reservoir meant for watering the animals. The construction of the drain itself isn't the reason for the bad drainage but the total absence of any apron slope in Kharan (SD). Whether LG or UNICEF is to be blamed remains somewhat undecided as the apron slopes of two demonstration pumps (No. 1 and 2) were utterly lacking too. Those two were made to show LG engineers how to construct an Afridev hand-pump.

If in the expansion phase attention will be paid to proper sloping of the apron, the drainage in Kharan will be excellent. In Kharan (B) drainage was good in five of the six cases. The slopes observed there were made on the initiative of the masons themselves.

[1]The assessment of the drainage of a hand-pump doesn't necessarily do so. If changes are made on the government drain or alternative or combined drains added by village people to it, then LG may not bear any responsibility at all for bad drainage. LG however will always be responsible if the apron is not sloped at all or is insufficient length of the discharge pipe makes the water fall on the slab first. This last shortcoming was often, in almost fifty percent of the cases, observed in Loralai. Extending the discharge pipe with a rubber tube, or by welding an iron extension to it is some sort of a solution but it shouldn't be necessary.

Chapter 5

FUNCTIONING OF THE HAND-PUMPS

The functioning of the hand-pumps was assessed first of all by measuring the water discharge capacity. In the Hand-pump Manual for the Afridev Hand-pump it is mentioned that one minute of pumping at a pace of some forty strokes, should give a water discharge sufficient to fill a bucket of twenty litre. In Table 7 100% water discharge equals twenty litre per minute.

Table 7 : **Discharge Capacity of the pump**

Water discharge capacity *District*	*25% -50%*	*50% -75%*	*75%- 100%*	*100% 125%*	*125% 150%*	*Not Functioning*	*Total*
Loralai	*2*	*3*	*2*	*11*	*1*	*4*	*23*
Zhob	-	*2*	*2*	*9*	*1*	*1*	*15*
Kharan (Sandy Desert)	-	*1*	*6*	*7*	*1*	*4*	*19*
Kharan (Besima)	-	-	-	*6*	-	-	*6*
Chagai (Nushki)	*2*	-	*7*	*2*	-	*2*	*13*
Chagai (Dalbandeen)	*1*	*2*	*5*	*4*	-	-	*12*
Total	*5*	*8*	*22*	*39*	*3*	*11*	*88*
Percentages	*5.7*	*9.1*	*25*	*44.3*	*3.4*	*12.5*	*100%*

In 12.5% of all cases the pump is not functioning at all. The functioning is insufficient in 14.8% of the cases. In 5.7% of the cases the functioning is really poor as the discharge lies 50% under the required capacity. A fair, good and excellent water discharge can be observed in 73% of all the cases.

It goes without saying that the pump performance should be improved during the expansion phase.

The functioning of the hand-pumps was furthermore studied by posing the question if there was more water available in the morning than in the evening. If the quantity is the same than the functioning of the pump is adequate. If not so, a few things might have to be looked after.

Table 8 : **Daily fluctuations in water discharge**

	Loralai	Zhob	Kharan (SD)	Kharan (B)	Chagai (N)	Chagai (D)	#	%
No Difference	21	12	13	5	10	10	71	80 7
Watertable rises during the night	1	2	2	-	2	2	9	10 2
Suction pipes are not deep enough	-	1	2	-	-	-	3	3.4
Due to watering of animals	-	-	-	1	12	-	2	2 3
Not Applicable /No Answer	1	-	2	-	-	-	3	3 4
Total	23	15	19	6	13	12	88	100

There is no difference in water discharge in 81% of the cases which is a satisfactory outcome. To the respondents who said there was a fluctuation in water discharge it was it was asked how they thought this irregular discharge was caused. More than ten percent of the respondents said that the water table rises during the night. This might indicate that cleaning the well is required or that the filling up of the bottom of the well with water just needs a lot of time. If in 3.4% of all cases an extension of the suction pipes would indeed solve the problem is questionable. It would be interesting to find out more about the influence the availability of a hand-pump has on the number of animals owned by the villagers. It may be so that people tend to prefer more animals rather than to use the increased amount of water to wash children's clothes. This point should be included in the 1992 Impact Study.

The last and third question posed was similar to the second one but focused on the amount of water available throughout the year.

Of all Hand-pumps 84% discharge the same amount throughout the year. The category that follows "More in the rainy season" is good for 7%. It should be understood that there is no such thing- or at least not reliable - as a rainy season in Chagai. In those two cases it means there is more water available when it rains. If it rains in Kharan or Chagai it will be during winter time.

The "due to migration category" refers to those cases in which either the water in summer reduces due to the nomads who fled the summer heat in Sindh and the Punjab or to the village people who come back in the villages in summertime whereas they live in other provinces during the winter.Less water available during summer (2.3%) shows one case in Kharan (SD) and Chagai (D). In both cases it is not surprising that the people are using more water in summer than in winter time; these districts are very hot indeed.

The table 9 in general shows that most pumps have been installed on wells which provide a reliable amount of water throughout the year.

Table 9 : **Water discharge throughout the year**

	Loralai	Zhob	Kharan (SD)	Kharan (B)	Chagai (N)	Chagai (D)	Total #	Total %
Equal Amount	17	14	15	6	11	11	74	84.1
More in rainy season	3	1	-	-	2	-	6	6.8
Due to migration	2	-	-	-	-	-	2	2.3
Interviewees do not know	1	-	1	-	-	_	2	2.3
People use more in summer	-	-	1	-	-	1	2	2.3
No answer	-	-	2	-	-	-	2	2.3
Total	23	15	19	6	13	12	88	100

Chapter 6
HYGIENIC CONDITIONS

The hygienic conditions around the pump were assessed with the help of two questions. The first one was whether there was mud around the pump and the second one whether the same was true for animal dung.

In most of the cases no mud was to be found around the pump within a radius of three meter from the apron. No animal dung was observed 48% of the cases. In somewhat more than a quarter of all the cases (27.3%), a little mud was lying around the pump. It was not likely that this mud would contaminate the water. The same was true for animal dung (26%).

A lot of mud around he pump was found in 16% of all the cases. Animal dung was all over the place in 23% of the cases. The animal dung looked less serious than the mud as it was dry in most of the cases.

Although the overall situation was not too bad, hygiene education is most urgently needed.

The drain design in Kharan District as a whole always included a drain at the end of the reservoir which was used for watering animals. In many cases however, the drain was not used for this purpose. Instead, people used wheel barrows or buckets for watering the animals or brought the animal to a somewhat distant, already existing, water basin. To install a drinking water facility for the animals may seem positive but consultation of the village people beforehand is necessary.

Table 10 : **Hygienic Conditions**

MUD AROUND THE PUMP				
	Yes	*Yes a little*	*No*	*No Answer*
Loralai	*5*	*11*	*7*	-
Zhob	*3*	*1*	*11*	-
Kharan (SD)	*2*	*3*	*12*	*2*
Kharan (B)	*2*	*1*	*3*	-
Chagai (N)	*2*	*3*	*7*	*1*
Chagai (D)	-	*5*	*7*	-
Total	*14*	*24*	*47*	*3*
Percentage	*15.9*	*27.3*	*53.4*	*3.4*
ANIMAL DUNG				
	Yes	*Yes a little*	*No*	*No Answer*
Loralai	*2*	*6*	*15*	-
Zhob	*1*	*2*	*12*	-
Kharan (SD)	*3*	*9*	*5*	*2*
Kharan (B)	*1*	*3*	*2*	-
Chagai (N)	*3*	*2*	*7*	*1*
Chagai (D)	*10*	*1*	*1*	-
Total	*20*	*23*	*42*	*3*
Percentage	*22.7*	*26.1*	*47.7*	*3.4*

Chapter 7
PERCEIVED OWNERSHIP OF THE HAND-PUMP

Once installed, a hand-pump should be easy accessible by each and every villager and of course by any passer-by. In some areas koochi people (nomads) spend several weeks or months of the year in one and the same place. Often they face problems in arranging a sufficient quantity of water. According to the PPA, the hand-pump installation should be used as an entry point for education on sanitation and hygiene.

Free access for nomads and village people to the hand-pumps however is a basic requirement for this sanitation and hygiene education to be successful.

Table 11 : **Perceived ownership of the hand-pumps**

	Loralai	Zhob	Kharan (SD)	Kharan (B)	Chagai (N)	Chagai (D)	Total	%
Community	9	6	7	1	3	5	31	25.2
One Villager	14	8	9	5	6	7	49	55.6
Outsider	-	-	2	-	4	-	6	6.8
Government	-	1	1	-	-	-	2	2.3
Total	23	15	19	6	13	12	88	100
CONSTRAINTS TO MAKE USE OF THE WATER								
No constraints	22	14	19	6	13	11	85	96.6
Constraints	1	1	-	-	-	1	3	3.4

The table above shows that most of the land on which pumps are installed is possessed by one villager 66% (49) followed by the communities, 35% (31). In 7% (6) it is an outsider who possesses the land and in only 2% (2) it is the government.

All this information starts making more sense if one realizes that of the 88 hand-pumps three are not freely accessible at all. One in Loralai (No. 5) where the handle is stored and thus makes operation impossible for outsiders. In Zhob (No. 6) a chain attached to the handle on one side and locked to the cover at the other side results in the same effects as the former one. In Chagai (D) (No. 8) one of the two pumps in that village - the only village in the entire Chagai district where two hand-pumps are installed- is located on the compound of a Member of Provincial Assembly. The gates of this compound are closed from 9.0 p.m. till 5.0 or 9.0 a.m. The people hesitate to enter the compound. To this water, it seemed, medical properties were attributed. People were allowed to take it in case of illness of one of their family members. In all the three cases the land where the pump was installed belonged to one village.

In Loralai four pumps are installed within compounds. They though have not been added to table 11. Due to strict purdah observance installing a hand-pump outside the compound will probably mean a constraint for women to fetch water. In theory more people will have access to the pump but practically such a public place may be hardly visited by women; they will prefer to walk longer to an alternative water source if less exposed to possible passers-by. Sometimes a wall around a pump may be a solution to overcome women's hesitancy but certainly not so in many cases. In Kharan and Chagai the village and its direct surroundings is considered not to pose a great risk for a woman. If male outsiders enter the village all women will instantly retreat in their homes. In pushtoon areas similar free movement for ladies is unthinkable.

Concluding it may be justified, under certain circumstances, to install a hand-pump within compound walls. Compounds in pushtoon areas by the way, are often inhabited by many people with well over one hundred inhabitant not being an exception.

Chapter 8
USE OF HAND-PUMP AND HAND-PUMP WATER

Table 12 (please refer to the next page) is a combined one giving information on a) who fetches the water most of all (women, young girls, boys or men), b) the animal and people's use of the water and c) the number of visits to the hand-pump per family per day. It was tried to come to know what people used the pump water for first of all, but it became quickly clear that the answers given were rather a guess than an adequate reflection of reality. Such a question would have been one pre-eminently to be asked from women by a female researcher.

ad a) Who fetches the water most of all.

That women are the ones to approach when water related issues are to be discussed rather than the men is clearly shown in the above table: They by far are the ones who fetch water (87.5%). Young girls and boys, both good for 1.1%, are hardly the ones in any case who fetch water. Men averaging 10.3% are not negligible but are by far outnumbered by women.

In Balochistan women need to be included in any water related project as without their active participation any such undertaking is doomed to fail.

ad b) Animal and people's use of the hand-pump water.

The Consultant became interested to know whether animals or people used the major share of all water pumped. The fact that in 92.8% of all cases people use most of the water s reassuring: What the pumps are meant for they are used for.

ad c) Number of visits to the hand-pump per family per day.

Most of the visits to the hand-pump by families are made in Loralai (8 on average) and both in Zhob and Chagai (N) the least (3 on average). Kharan (B) (3.5), Kharan (SD) (5) and Chagai (D) (6.5 on average) are situated in between the extremes.
In three cases, one in Loralai and two in Kharan (SD) the people replied the pump is visited all day long and that the visits paid are countless.

Table 12 - **Which family member fetches the water mostly**

	Loralai		Zhob		Kharan (SD)		Kharan (B)		Chagai (N)		Chagai (D)		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
WHICH FAMILY MEMBER FETCHES THE WATER MOSTLY														
Women	*20*	*87*	*14*	*93.3*	*15*	*78.9*	*5*	*83.3*	*13*	*100*	*10*	*83.3*	*77*	*87.5*
Girls	-	-	*1*	*6.7*	-	-	-	-	-	-	-	-	*1*	*1.1*
Men	*3*	*13*	-	-	*3*	*15.8*	*1*	*16.7*	-	-	*2*	*16.7*	*9*	*10.3*
Boys	-	-	-	-	*1*	*5.3*	-	-	-	-	-	-	*1*	*1.1*
Total	*23*	*100*	*15*	*100*	*19*	*100*	*6*	*100*	*13*	*100*	*12*	*100*	*88*	*100*
PEOPLE'S AND ANIMAL'S CONSUMPTION OF THE WATER PUMPED (In end total calculation Kharan (SD) is not included)														
People	**23**	**100**	**15**	**100**	**1**	**5.3**	**4**	**66.7**	**11**	**84.6**	**11**	**91.7**	**64**	**92.8**
Animals	**-**	**-**	**-**	**-**	**2**	**10.5**	**2**	**33.3**	**2**	**15.4**	**1**	**8.3**	**5**	**7.2**
Not Applicable	**-**	**-**	**-**	**-**	**16**	**84.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
AVERAGE NUMBER OF PUMP VISITS PER FAMILY PER DAY														
Visits per family per day on average	*8*		*3.1*		*5*		*3.5*		*3*		*6.5*		*Average is about 5 visits a day*	
Visit pump continuously as pump is nearby	*1*		*2*		–		-		-			-	*3*	
Not Applicable /No Answer	*1*		*1*		*1*		-		-		-		*3*	

Chapter 9
IMPACT OF THE HAND-PUMPS

Assessing the impact of the hand-pumps a year or less after the installation may seem premature but can still result in some interesting information.

In the first table of this chapter it is set out which water sources the people relied on before the hand-pumps were installed. This information was gathered as the Consultant thought it would probably influence people's perception on the impact of the hand-pump installation.

From the second table one can learn what people's perception on the changes brought about are.

In the third and fourth table it is assessed if time is saved as a result of the hand pump installation. If so, it is examined how this time is spent.

The last table "Constraints in Daily Life" does not directly relate to the impact of the hand pump installation. It gives however an impression of the eagerness of the villagers to improve their water supply situation

Please refer to table 13 of this chapter: Water sources before hand-pump installation

It is the priority of UNICEF to install hand-pumps on an already existing well. As a result, no wells needed to be dug in 81% of all cases. Percentage-wise most wells were dug in Loralai (only 65% of all hand-pumps in that district were installed on already existing wells).

Concerning water sources the two Pushtoon areas are better of than the two Baloch districts. In Loralai and Zhob there are often more (up to ten) wells in the village than the one on which the pump has been installed.

In the Baloch districts there are much less wells. Besides, the wells existing are saltish in many cases.

Rainwater in Zhob is a more or less permanent water source as it is stored in ponds. In the Baloch districts, in Kharan and Chagai however, people dig a small temporary well only after rainfall. It rarely rains in the Baloch districts. Tube-wells in the Baloch areas are often not working and no storage tanks have been installed. In a few cases villagers have to pay if they want to fetch water.

In the Pushtoon districts streams and springs are nearby (Loralai 43% and Zhob 26.7 %) but in Chagai (N: 15%, D: 17%) often far away.

All this means that one can expect a much more far reaching impact in the Baloch districts than in the Pushtoon Districts. The fact that a difference in impact can not be read from the tables is probably due to the fact that only men have been interviewed.

On the question which changes had come about since hand pump installation (Refer to table 14: changes felt by villagers as a result of the hand-pump installation) the most frequent replies were the easy way of handling (47%) and the cleanliness of the water (44%). The fact that the pump is easy to handle makes it possible for children to wash themselves without any help of adults.

In some villages men had been responsible for the water collection before the hand-pumps were installed. Since the hand-pumps have been introduced however, women have taken over that task.

Table 13 : **Water sources of the villagers before the hand-pumps were installed**

	Loralai		*Zhob*		*Kharan (SD)*		*Kharan (B)*		*Chagai (N)*		*Chagai (D)*		*Total*	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Well under Pump	15	65.2	11	73.3	18	94.7	6	100	10	76.9	12	100	72	81.8
Other well in village	7	30.4	7	46.6	6	31.6	1	16.7	2	15.4	7	58.3	30	34.1
Rainwater	-	-	7	46.6	3	15.8	1	16.7	3	23.1	1	8.3	15	17
Well outside village	-	-	1	6.7	-	-	-	-	3	23.1	2	16.7	6	6.8
Well in other village	-	-	2	13.3	-	-	-	-	2	15.4	1	8.3	5	5.7
Tubewell	4	17.4	-	-	-	-	1	16.7	6	46.2	3	2.5	14	15.9
Stream/Spring/ Karez	10	43.5	4	26.7	-	-	-	-	2	15.4	2	16.7	18	20.5
Water supply scheme	1	4.3	-1	6.7	-	-	-	-	-	-			2	2.3
No answer/ Not Applicable	-	-	-	-	1	5.3	-	-	-	-	-	-	1	-

Table 14 : **Changes felt by villagers as a result of hand-pump installation**

	Loralai		Zhob		Kharan (SD)		Kharan (B)		Chagai (N)		Chagai (D)		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#
Easy to handle now	13	56.6	5	33.3	8	42.1	3	50	2	15.4	10	83.3	14
Water is clean	18	78.3	6	40	6	31.6	-	-	1	7.7	7	58.3	38
Time is saved	6	26.1	3	20	6	31.6	1	16.7	-	-	-	-	16
Water from the pump is sufficient for all	-	-	. 6	40	-	-	-	-	-	-	-	-	6
Less people are ill	1	4.3	-	-	-	-	1	16.7	-	-	-	-	2
Former sources of water no longer used	-	-	-	-	-	-	-	-	3	23.1	3	25	6
No dirt or animals fall in the well any more	2	8.7	1	6.7	2	10.5	1	-	1	7.7	3	25	10
Permanent source of water	6	26.1	-	-	-	-	_	-	-	-	-	-	6
Water nearby now	6	26.1	-	-	-	-	-	-	-	-	-	-	6
Other	1	4.3	2	13.3	9	47.4	1	16.7	6	46.2	-	-	19
No Answer/Not Applicable	1	4.3	-	-	2	10.5	1	16.7	1	7.7	-	-	5

It has been examined if time is saved as a result of hand-pump installation by posing two questions: "What are the changes since hand-pump installation" and " Is time saved as a result of hand-pump installation"

Table 15 : **Is time saved as a result of hand-pump installation**

	Time Saved	*No Time Saved*	*No Answer or Not Applicable*	*Total*
Loralai	*22*	*1*	-	*23*
Zhob	*13*	*1*	*1*	*15*
Kharan (SD)	*14*	*2*	*3*	*19*
Kharan (B)	*5*	*1*	-	*6*
Chagai (N)	*13*	-	-	*13*
Chagai (D)	*10*	*1*	*1*	*12*
Total	*77*	*6*	*5*	*88*
Percentage	*87.5%*	*6.8%*	*5.7%*	*100*

It is interesting to note that only 18% of the respondents spontaneously mention that less time is spent on water fetching. If it is directly asked to the people if time is saved however, they answer yes in 87% of the cases. The reason for the low percentage of respondents who mention spontaneously that time is saved is probably that only men have been interviewed. As women were in most of the villages responsible for water collection, they will have felt the time-saving aspect of the hand-pumps much more than the men. In table 16 (please refer to next page) it has been set out how the time saved is spent according to the men.

As it can be seen from table 16, most of the time saved is spent on embroidery (32%) and used as spare time (31%). The high average percentage for "spare time" is due to the outcome of the Loralai district, where people mentioned "spare time " in 50% of the cases. The Consultant thinks that this outcome is quite doubtful but can not judge it properly as he has not visited this district himself. From the fact that income-generating activities are undertaken in 55% of all cases it can be concluded that spare time created by hand-pump installation has probably resulted in an increase of people's income. It is assumed here that the embroidery work is partly done on a commercial basis.

Table 16 : **How is time saved spent**

	Loralai	*Zhob*	*Kharan (SD)*	*Kharan (B)*	*Chagai (N)*	*Chagai (D)*	*Total (Kharan SD not included)*	*Percentage (Kharan SD not included)*
Work on land	*2*	-	*5*	*3*	*5*	*2*	*12*	*12.6*
Care for animals	-	-	*1*	*1*	*2*	*1*	*4*	*4.2*
Spare Time	*22*	*3*	*1*	-	*1*	*3*	*29*	*30.5*
Sewing and embroidery	*15*	*9*	-	*1*	*4*	-	*30*	*31.5*
Employment elsewhere	_	-	-	-	-	*1*	*1*	*1.1*
Domestic work (Washing clothes etc.)	-	*3*	-	*1*	*5*	*2*	*12*	*12.6*
Collect and sell wood	-	*1*	*1*	*1*	-	*2*	*4*	*4.2*
Construction work	-	_	-	-	-	*1*	*1*	*1.1*
Pay more attention to children	*3*	*1*	-	-	-	-	*4*	*4.2*
Total	*42*	*17*	*8*	*7*	*17*	*12*	*95*	*100*

In order to find out what the village people perceive as their biggest daily problems a question was asked about the three most important constraints they face in daily life.

Table 17 : **Constraints in daily life**

	First constraint mentioned		*Second constraint mentioned*		*Third Constraint Mentioned*	
	#	*%*	*#*	*%*	*#*	*%*
Total Number of Respondents	*78*	*88.6%*	*65*	*73.8*	*38*	*43.2*
Water related constraints	*26*	*33.3*	*11*	*16.9*	*1*	*2.6*
Education related constraints	*10*	*25.6*	*12*	*18.4*	*8*	*21*
Health related constraints	*6*	*20*	*13*	*20*	*8*	*21*
Number of respondents that mentioned water, health and/or education as a constraint	*42*	*66.5*	*36*	*55.3*	*17*	*44.8*

We see that water-, education- and health related constraints together account for 67% of all answers given in reply to the first most important constraint, 55% for the second and 45% for the third most important constraint. The fact that water related problems are most frequently mentioned as the most important constraint faced, indicates the people's eagerness to improve the water supply.

Loralai shows a very different pattern. The first constraint there are latrines, accounting for 77% of all answers given. There are two reasons for this: The first and most important one was the fact that prominent villagers were in possession of a latrine and thus were taken as example. The second one was that interviewer told he had difficulties convincing the people he was not in a position to offer them government support. Asking for latrines, the villagers thought, was a modest enough request to be complied with by the interviewer.

Chapter 10
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The survey methodology followed, using a questionnaire with mostly closed questions, combined with discussions and observations, provided the Consultant with a vast amount of basic data.

A few constraints were encountered during the preparation and implementation of the short study. The most important ones were the absence of a lady interpreter and the fact that the Consultant was not allowed to visit the Pushtoon districts. The Consultant had to rely on the observations of his assistants in the Pushtoon areas.

A general conclusion that can be drawn is that the work done during the demonstration phase has been successful. The change that the installation of the hand-pumps brought about in the villages is overwhelmingly received positively by the beneficiaries. If the programme is to remain a success in the expansion phase however, attention needs to be paid to certain aspects. The remainder of the conclusions and recommendations elucidates these aspects.

GENERAL VILLAGE INFORMATION

Village selection criteria

The population criterion used in the criteria for selection demands that there should be at least two hundred users per hand-pump. It has proven difficult to realize such a minimum number of users in all cases. The majority of all villages however (64.7%) have a population of two hundred and above. Sometimes less than two hundred beneficiaries in a village should not be seen as a selection failure. In the case of Loralai district hand-pumps are installed in compounds. Because of strict purdah observance the number of beneficiaries in such a village would have been reduced even more if the hand-pump would have been installed in the centre of the village.

In the expansion phase an effort should be made though to increase the percentage of the more populous villages. PHED should be strict and clear about to whom it will provide a piped water supply scheme. Villages belonging to the hand-pump category should not be promised or given anything by PHED. In Kharan, villages refused a hand-pump because they feared it would exclude them from a PHED scheme. PHED, UNICEF and LG&RDD need to coordinate more. If they fail to do so the Planning and Development Department needs to take action.

The visits by UNICEF and LG

UNICEF should visit hand-pumps more frequently. Short reports, more than is the case now, should be written and filed. The last is true for the LG as well. Such field reports should at least include date, duration and purpose of visit. Furthermore whether repairs

were made or not and their nature. Such information should be available hand-pump-wise. It will be of help to improve pump spare part logistics. Without proper logistics spare part problems are to arise in the expansion phase.

INSTALLATION OF THE HAND-PUMPS

Location of the hand-pumps

Hand-pumps have been installed mostly on already existing well. The fact that several pumps in Kharan (SD) and Chagai (N) are located far from the villages is not to be blamed on LG; they had to apply this rule and keep the total costs down. The adequacy of the rule however, should be considered.

Technical quality of the pump

Of all pumps 81.8% were technically fit and 90.9% were giving water. These are not alarming figures but if hundreds more pumps are installed the performance needs to be improved.

Condition and quality of the cemented parts of the pump.

A standard design of the pump would be useful. The apron should have a good slope, a ridge and groove all around and should be at least twenty to thirty centimetres above groundlevel. The slab should be well above the apron and the cover surrounded by a raised ridge to prevent water from leaking back into the well. The pedestal is alright everywhere. The discharge pipe should be directed towards the drain. Too often this is not the case. The drain should be at least fifteen centimetres above groundlevel and never be shorter than three metre.

Whether a basin for watering the animals should be installed needs to be decided in consultation with the people. If for instance they prefer to water their animals with the help of a wheel barrow such a basin should not be made. Attaching a ramp to the apron, to facilitate the wheel barrow's access to the pump, might then be a good idea.

In general the work done by LG is good. The absence of a slop in the aprons of the hand-pumps of Kharan (SD) is a pity but the assistant engineer in charge is not to be blamed as the demonstration pumps didn't have one either. The drains in Loralai need to be improved in several cases as they are too short.

Drainage

Due to the lack of slopes in the Kharan (SD) aprons the overall drainage performance was poor. In Loralai the drainage was often bad, not due to a lack of proper sloping but due to the shortage of the drain.

Still in 37.5% of all cases drainage was excellent or good and adequate in 21.6%. If apron sloping is standardized as well as a minimum length of two meter of the drains, then the overall performance will improve definitely.

FUNCTIONING OF THE HAND-PUMPS

Water discharge capacity

In 12.5% of all cases the hand-pump was not functioning at all. At less than half of the desired capacity of twenty litre pumped per minute were five pumps (5.7%). Above 75% of capacity were 67 (72.7%) of all pumps. Performance should improve during the expansion phase.

Daily fluctuation in water discharge

In 80.7% of all cases there is no difference in the daily water discharge. This is satisfactory. Cleaning of the wells will help improve this figure more but it will not reach the hundred percent as excessive animal watering sometimes causes the fluctuation.

Water discharge throughout the year

Seventy four pumps (84.1%) give an equal amount of water throughout the year. In no case the pump ceased to give water. All hand-pumps visited are installed on well performing wells.

HYGIENIC CONDITIONS

Mud and or animal dung around the pump

About half of the pumps visited had mud and or animal dung around the apron. Proper drainage and hygiene education to the village people is what is urgently needed.

PERCEIVED OWNERSHIP OF THE HAND-PUMPS

Who owns the land / Constraints to make use of the water

Land on which the hand-pumps are installed belongs in 90.1% of all cases to one villager or to the community. Outsiders and the government are responsible for the remaining ten percent.

Constraints to make use of the hand-pump (this is the case in 3.4%) are hardly there. Village people should sign a contract that they will not chain or store the handle, build a wall around the pump or do anything that makes free access to the hand-pump difficult or impossible. Something should be worked out the coming months to ensure that such a procedure is followed in the expansion phase.

USE OF THE HAND-PUMP AND THE HAND-PUMP WATER

Which family member fetches the water mostly

Women are by far the ones who most of all fetch the water (in 87.5% of all cases). Their involvement in anything that relates the water is therefore indispensable. However, nothing indicated such an involvement.

People's and animal's consumption of the water pumped

Kharan (SD) was not included in the analysis. It were overwhelmingly people who used most of the water pumped (92.8%).

Average number of pump visits per family per day

Visits to the pump average about five per day with the highest score in Loralai (8) and the lowest in Chagai (N) and Zhob (3).

IMPACT OF THE HAND-PUMP

Water sources before the hand-pumps were installed

In 81.8% of all cases hand-pumps were installed on already existing wells. Pushtoon districts have better water sources than Baloch districts. The tables on impact that follow however, do not reflect this. This is probably due to the fact that women have not been interviewed.

Changes since hand-pump installation

Easy handling and water being clean, sweet and covered were the most evident changes by far. Children can take water easily now and can help each other washing themselves. Hygiene education should stimulate this. In Kharan more women now fetch water than before as it is now increasingly considered a female's task as handling doesn't require a lot of physical effort.

Is time of villagers saved as a result of the hand-pump installation

Asked about the changes the hand-pumps installation brought along 16% of the respondents told time was saved. Asked directly whether time is saved or not 87.5% answered yes. This is a good result although one needs to keep in mind that women's opinion is not reflected.

How time saved is spent

Most of the time saved is spent on sewing and embroidery (31.5%) and on "spare time" (30.5%). In 54.7% of all cases income generating activities are undertaken or at least possible. An increase of overall village income will be the result.

Constraints in daily life

Water related constraints were, as was expected, strongly represented in the category of first most important constraint. This shows how eager and motivated people are to improve the water supply situation. Education and health related constraints were highly represented as well.

SOME OTHER REMARKS

Community development cell

A basic requirement for the hygiene and sanitation component of the programme to be successful is that the working methods and messages passed over are adopted to the local socio-cultural setting. During the study the Consultant observed that the socio-cultural gap between the LG officials and the village people is quite big. Even if the LG people come from the villages themselves they belong to the higher strata of the village. It is unrealistic to think that those people can develop the villages from the bottom up.

Instead the Consultant proposes the setting up of a community development cell for the project. In this cell people who have shown keen interest in community development already (e.g. those who studied social work, sociology etc. and those who do have a vast experience in this field) should be employed.

People working in this community development cell need to be in the field three weeks per month at least. They will be, due to their frequent presence in the field, the ones to monitor the project's implementation. This cell should be actively involved in the selection of villages as well of which UNICEF should have a veto.

Mapping work and photographic documentation should be part of their responsibilities as well to allow more and faster insight in the programme.

Without such a community development cell or a similar change to be made, the programme will fail to meet its objectives.

Hand-pump caretakers

In almost all villages the villagers mentioned only one name when asked about the name of the hand-pump caretaker. It is doubtful whether two hand-pump caretakers per village received training. In two cases the situation the Consultant found in the villages showed that the hand-pump training had not been effective. In one case all pipes were taken out to repair the pump whereas this should never be done. In the other case the pumping produced some strange noise. Instead of repairing the pump or trying to do so, nothing was done but waiting for the LG to pass by.

The idea to give each and every hand-pump caretaker Rs. 100 per month will not work. If the person in question is to find work for half a year in some other place the Rs. 100 will not keep him from leaving so. If per district area hand-pump caretakers are employed for a proper salary, the results will be good for the time to come and the overall costs will be lower.

These hand-pump caretakers should live in the area they work in. They should arrange transport to the pumps themselves and be provided with spare parts by the district engineers regularly. Reporting should be done to the community development section who will take care of proper storing and filing of information. As the care takers will be small in number, training them will be much easier then in the case of two hand-pump caretakers per village. In the future those hand-pump caretakers could become self sufficient if they start charging for their services.

If this change is not brought about, more pumps will be out of order in the expansion phase than LG engineers will be able to repair.

Transport Problems

The UNICEF provided vehicles are hardly ever used for the purpose they are meant for. Visits by the district engineers to the villages are because of this often extremely difficult to make.

In Chagai (D) all pumps were constructed along the highway and not as was indicated on the map UNICEF provided the Consultant with. The transport problem was the cause of this. This may happen during the expansion phase in Kharan or elsewhere. UNICEF should correct this situation very soon.

APPENDICES

1 List of the hand-pumps visited

2 Questionnaire

3 Copy of selection criteria for hand-pump installation

4 Terms of Reference of Consultant

APPENDIX 1 - LIST OF HAND-PUMPS VISITED

LORALAI DISTRICT

1) Killi Ponga
2) Killi Thaty Nasiran (hand-pump no. 1)
3) Killi Thaty Nasiran (hand-pump no. 2)
4) Killi Pathan Kot (hand-pump no. 1)
5) Killi Pathan Kot (hand-pump no. 2)
6) Killi Bawar
7) Killi Oriagi Nasir Abad
8) Killi Lashti
9) Killi Suleiman Khel Kanobi
10) Killi Nigang
11) Killi Kachh Amaqzai
12) Killi Urbasin
13) Killi Ghundi
14) Killi Mehmood Abad
15) Killi Zareef Khan
16) Rabat Wakam: Killi Wadera Isa Khan Marri
17) Sharguli Rabat Killi Haji Lal Beg
18) Killi Haji Abdul Wahab Rabat
19) Killi Noor Ahmed Rabat
20) Killi Haji Qaim Khan
21) Killi Khud-i-Rahim
22) Mekhtar School
23) Mekhtar Mosque

ZHOB DISTRICT

1) Killi Gardani
2) Killi Laher Karmzai
3) Killi Pasta Takai
4) Killi Ghor Lama
5) Killi Band
6) Killi Kuri Wasta
7) Killi Ibrahim Khel
8) Killi Viala
9) Killi Sainzai
10) Killi Burenj
11) Killi Sadat Pitaw
12) Killi Zarbor
13) Killi Khanzai
14) Killi Darozai
15) Government Girls Primary School Zhob

KHARAN DISTRICT

Kharan (Sandy Desert)

1) Killi Sherozi
2) Killi Latar
3) Killi Thagazi
4) Killi Bop Reg Ali Dost
5) Killi Dad Mohammadd. Bop Reg (hand-pump no. 2)
6) Killi Dar Raich
7) Killi Ladgasht
8) Killi Kohak
9) Killi But Gowash
10) Killi Shaheed Abad Dao
11) Killi Pir Dad
12) Killi Daily Kalagan
13) Killi Ghazi
14) Killi Abdul Khaliq
15) Killi Zarozi
16) Killi Mohammad Waris
17) Killi Haji Mahmood Akbar
18) Killi Shayan
19) Killi Haji Abdul Razzaque

Kharan (Besima)

20) Killi Damag
21) Killi Mumai
22) Killi Sultan Mohammad
23) Killi Barkat Siahozai
24) Killi Mir Aziz Mohammad
25) Killi Ghulam Rasool.

CHAGHAI DISTRICT

Chaghai Nushki

1) Killi Noor Khan (Railway Station Nushki)
2) Killi Imam Bakhsh Kaishingee
3) Killi Noor Bakhsh Kaishinghee
4) Killi Haji Murad Ali Khaisar
5) Killi Shah Mohammad Kaishingee
6) Killi Batto Landi
7) Killi Zingiabad
8) Killi Rahmat Dooni
9) Killi Haji Abdul Karim
10) Killi Abdul Nabi
11) Killi Jalal Shah
12) Killi Abdul Karim
13) Killi Jan Beg

Chaghai Dalbandeen

1) Killi Padag Abdul Masjid
2) Killi Noor Mohammad
3) Killi Abdul Aziz
4) Killi Bahadur Khan (1)
5) Killi Bahadur Khan (2)
6) Killi Lagap Malik Rasool Bakhsh
7) Killi Sargeesha
8) Killi Sargeesha (Hand-pump No. 2)
9) Killi Neek Mohammad
10) Killi Ata Mohammad
11) Killi Mohammad Azam
12) Killi Ghulam Sarwar

APPENDIX 2 - QUESTIONNAIRE

QUESTIONNAIRE / GUIDELINE FOR A SHORT UNICEF STUDY JULY - AUGUST 1991

I GENERAL VILLAGE INFORMATION.

1) District:..... 3) No. .... to visit

2) Village:.....

4) Date of visit: .../..../ 1991 5) Time of arrival:..... 6) Time of departure:.....

7) No. of houses / families:.....houses .....families. 8) Family members: .... on average.

9) Date of installation handpump:.../..../ 1991

10) Name of handpump caretaker:.....

11) No. of visits of LGRDD staff since installation:..... and (12) of UNICEF staff.....

II THE FUNCTIONING OF THE WATERPUMPS.

A) .....seconds to fill a buckett of three liters of water

B) Is there more water available in the morning than in the evening 0 yes 0 no

B1) If yes provide detail .....

.....

C) Is there an equal amount of water available throughout the year 0 yes 0 no

If no, provide detailed information .....

.....

III INSTALLATION OF THE WATERPUMP

A) Describe the location of the pump in the village (central - at the edge - central at the edge etc.) .....

B) Is the pump technically fit (no defects or defects likely to happen soon) 0 yes 0 no

C) What is the condition of the apron (1), slab (2), pedestal (3), drain (4)
(No. ... to visit)

	(1)	(2)	(3)	(4)	
Excellent		( )	( )	( )	( )
Good	( )	( )	( )	( )	
Adequate		( )	( )	( )	( )
Bad	( )	( )	( )	( )	

D) Is there proper drainage 0 no 0 yes 0 good
(keep in mind there is a difference between L.G. drains and local made drainage extensions) 0 adequate

0 bad

IV THE HYGIENIC CONDITIONS OF THE WATERPUMP

A) Is there mud around the pump 0 yes
0 yes, a little
0 no

B Is there any animal dung around the pump 0 Yes, all over
0 Yes, a little
0 no

C Is there a place for animals to drink while not contaminating the drinking water

0 Yes, not contaminating at all
0 Yes, but risk of contamination
0 No, not at all

V PERCEIVED OWNERSHIP

A Who posesses the land where the waterpump has been installed:
0 community
0 one villager
0 outsider

B. Are there any constraints for people to take water from the hand pump
0 yes
0 no

C. Is anyone or any group of village people arranging or responsible for operation:
0 yes
0 no

VI USE OF WATERPUMP AND WATERPUMP WATER (No. .... to visit)

A. Who draws the water in this village most of all: (1) women (2) young girls (3) boys

(4) men: .... and sometimes .....

B. How many times per day is water drawn per family on average: .....

C. When is the pump most frequently used: 0 early morning 0 morning, from 8 till 12

0 from 12 till 4 p.m. 0 from 4 p.m. till 8 p.m. 0 after 8 p.m. 0 whole day long

D. The water drawn from the pump is used first of all for:
0 animals
0 people

E. People use pumpwater first of all for (1st, 2nd etc.):
( ) drinking water
( ) washing clothes
( ) washing themselves
( ) cleaning kitchen utensils
( ) other .....

VII IMPACT OR EXPECTED IMPACT OF THE PUMP

A. Mention the watersources before the installation of the waterpump; make a distinction between potable and non-potable water:

	Potable yes(1), no(2)	distance
1) 0 well under pump	( )	
2) 0 other well in village	( )	
3) 0 rainwater	( )	.....km
4) 0 well outside village	( )	.....km
5) 0 well in other village	( )	.....km

B. What has been the change in the use of these various sources since the installation of the waterpump: .....

.....

.....

C. If time is saved since then, how much is it on a daily basis: .....minutes

D. What is the saved time used for: 0 work on land
0 more care for animals
0 spare time
0 embroidery
0 other .....

D. Give advantages and disadvantages of the location of the pump in the village: .....
.....

(No. ... to visit)

(1) 0 on the spot of our only well (or if more then one well, the only sweet one)

(2) 0 it is far from the village

(3) 0 not all village people agreed upon this spot

(4) 0 it is not easy accessible for everyone

(5) 0 other .....

(6) 0 other .....

G. Mention the three biggest constraints the village people meet in their daily lives:

1) .....

2) .....

3) .....

VII REMARKS

APPENDIX 3 - SELECTION CRITERIA FOR HAND PUMP INSTALLATION

In general, the selection of sites/villages for the installation of community hand pumps are made by LG&RDD in consultation with UNICEF by following criteria:

1) Sites should be in deprived areas of the district, specially where the drinking water problem is acute to ensure that hand pump schemes will be operated and maintained by the beneficiary community.

2) Siting of hand pump schemes should be made in public and permanently accessible places to women and children, and installation should be made preferably in existing drilled or open wells where underground water depth is in the range of 20-150 ft.

3) A minimum of 200 users for each community hand pump should be assured.

4) Each hand pump scheme should be an entry point to sanitation and health/hygiene education activities which should include the construction of at least 20 household latrines and the application of hygiene practices.

5) For areas/villages where no open wells or boreholes are available, hand drilling should be encouraged as an immediate and low cost technology.

6) Rural primary and/or middle girls schools which at present do not have adequate water and sanitation facilities and where teachers are willing to cooperate have preference.

7) Selected sites should be permanently accessiblefor project execution and monitoring.

8) Community/VLOM commitment to hand pump operation and maintenance as well as their active participation in all sanitation and health hygiene education activities will be obtained.

APPENDIX 4 - TERMS OF REFERENCE OF CONSULTANT

The terms of reference of the Consultant were the following:

- To locate all hand pumps installed with support from UNICEF during the last two years;
- To assess the functioning of these pumps, using a rating system (good, fair, poor, not functioning);
- To gain a good idea about the perceived ownership situation through informal talks with the villagers and village leaders;
- To study the installation of the pumps (slabs, drainage) with special consideration for the quality of work, using a checklist with 4-6 criteria and scoring for each criteria (rapid assessment);
- To evaluate hygiene conditions around the handpump wells and the risks of pollution;
- To take photos of each well (one photo: the name of the village and the district should be clearly visible);
- To analyze the collected data and to identify strong and weak points in the ongoing UNICEF supported programme;
- To formulate recommendations concerning future hand pump schemes and community involvement; and
- To make suggestions for follow-up monitoring and evaluation.