

Community Management & Monitoring Unit

Preliminary analysis of the  
Water Point Inventory in Eastern, Southern and  
Central provinces.

Community Management & monitoring Unit  
P.B. RW 308X,  
Ridgeway,  
Lusaka, Zambia.  
Tel: 260611/252078

January 1994.

1971

1971



COMMUNITY MANAGEMENT & MONITORING UNIT

WELL POINT INVENTORY - PRELIMINARY ANALYSIS

1. INTRODUCTION

1.1 COMMUNITY MANAGEMENT & MONITORING UNIT

The Community Management and Monitoring Unit (CMMU) was set up in July 1993 to address some of the important issues pertaining to Rural Water Supply and Sanitation (RWSS) in Zambia. One of the major tasks of the CMMU is the collection and synthesis of data in relation to RWSS and at present the unit is conducting a water point inventory of all rural communal water points in Zambia. This report presents the preliminary findings from more than 2,000 water points which have been surveyed in Eastern, Southern and Central Provinces during the period October to December 1993.

2. OBJECTIVES OF THIS REPORT

- 2.1 This report has been produced by the CMMU in order to indicate to the parties involved in the RWSS sector, the current status of rural water supply throughout Zambia (eventually) but more specifically in Eastern, Southern and Central Provinces at present. In particular the report highlights the condition and functionality of these water points with an emphasis on technical issues.
- 2.2 It is also intended that this report stimulate debate as to possible strategies which could be developed to alleviate some of the problems being experienced by rural communities in relation to rural water supply and sanitation.
- 2.3 The information extrapolated from the water point inventory and this and subsequent reports should be of particular use to planners and extension staff of GRZ institutions, Donor Agencies and NGO's involved in the sector. It is hoped therefore that the organisations involved in the sector will take note of these data and contact CMMU staff regarding their interpretation and recommend possible changes to the data collection methods or actual data which should be collected.

*purpose of unit? to collect  
or  
to evaluate data  
for decision-making*

WV 13382  
824 ZM94

- plot w/s data  
against  
population

↳ for decision making

during 1992 drought  
no data on existing W/P  
w/cell assessment / planning  
very difficult  
→ investment warranted

not clear whether WASAFS  
was used (I believe)

### 3. INTERPRETATION OF THE RESULTS

- 3.1 The data presented here were collected from Eastern, Southern and Central Provinces, as earlier indicated. They should not be taken as indicative of trends for the country as a whole. However it is considered that they are probably indicative of trends for these three provinces.
- 3.2 This information is a compilation of data from ALL districts in each of the above provinces and therefore is not district or area specific. However, the information is available at district or even ward level should this be required. At the time of writing it was not considered appropriate to present these data at a lower (district or ward) level as it is estimated that the data collected is only 50% - 70% complete for these provinces, Central Province even less.
- 3.3 The interpretation of the data given in this report is based on observation and experience of the CMMU staff and does not necessarily represent the views of GRZ institutions, Donor agencies or NGO's working in the RWSS sector. It is not intended that these results highlight "flaws" or "inappropriateness" of the work of any institution or organisation, rather they are intended to give an indication of the current status of rural water supplies. Comments as to the validity of the interpretation of these results are more than welcome. Contact CMMU staff (Tel. 260611\ 252078 or P\Bag RW 308X, Ridgeway, Lusaka).

### 4. SURVEY METHODOLOGY

- 4.1 At present there are 21 water point inventory enumerators in the field working in each district of the provinces already indicated. These enumerators are usually Water Development Officers (WDO) attached to the Department of Water Affairs. Where WDO's were not available, school leavers (Grade 12) were selected by the respective Provincial Water Engineer to fill the position of enumerator (school leaver enumerators are employed temporarily by the CMMU).
- 4.2 Each enumerator is equipped with a motor cycle, tape, bucket and other necessary surveying equipment. Existing water point lists, supplemented by local information are used to identify water point locations. Each site is visited individually and a questionnaire is completed (a copy of the current questionnaire is attached. See Appendix 1). Enumerators are visited by project staff about every 4 weeks and completed questionnaire are collected.

- 
- planning
- ① help in underserved areas
  - ② we want to do LP-based WS development for which we feel we need data relating to functioning, cost elements / investment, community organization
  - ③ policy development in LP-based WS-dev't
  - ④ alternative system development
    - ↳ rain water harvesting
    - ↳ solar

4.3 Completed questionnaires are taken to Lusaka, labelled and filed by District. The information is then transferred into DBASE IV for later analysis. Due to time constraints not all the data collected are analysed and presented here. Visitors are welcome to the CMMU to inspect the data collected. Please try to give a bit of notice!

5. PRESENTATION OF THE RESULTS

5.1 The results presented are given in two different ways:

- i. Topics are outlined through narrative supplemented with tables and interpretations which are followed by:
- ii. Pie\Bar\Line\Charts giving a visual illustration of the findings.





1. Distribution of Surveyed Water Points

The analysis given here are based on a total of 2,125 water points which were surveyed in Eastern (EN), Southern (SN) and Central (CL) Provinces between 1st October and 11th December 1993. The total surveyed from each province is given in Table 1 below:

TABLE 1 : Distribution of Surveyed Water Points

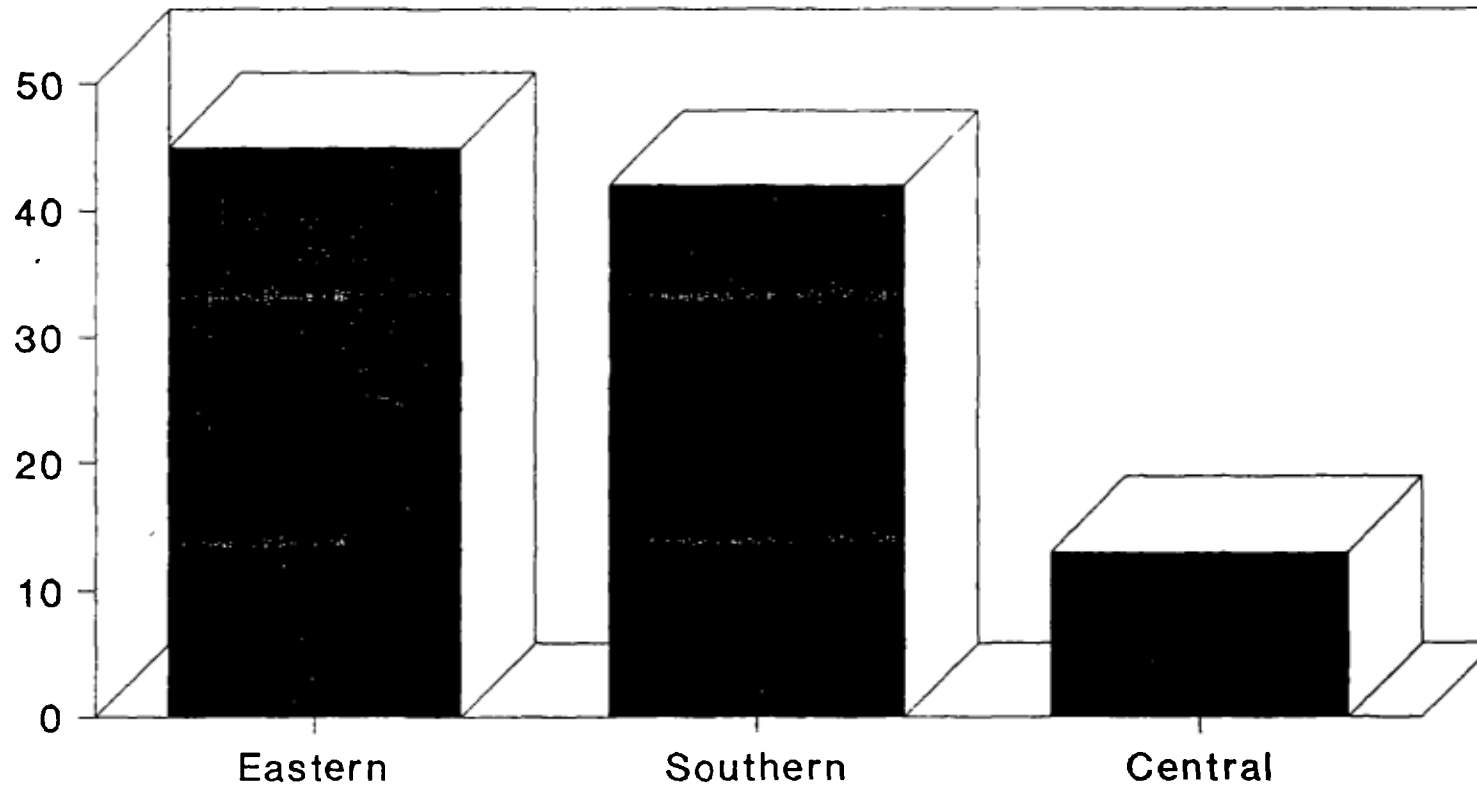
PROVINCE	NUMBER SURVEYED	PERCENTAGE
EASTERN	965	45
SOUTHERN	886	42
CENTRAL	274	13
TOTAL	2,125	100

It is clear from the Table above that the number of water points surveyed per province or district vary considerably. District variations range between 230 (Choma district, SN) to 24 (Serenje district, CL). This may be due to a number of reasons, for instance density of water points, distance from centre, road conditions and motivation of individual enumerators. Furthermore, in the case of Central Province the water point inventory started two weeks later than in Eastern and Southern Provinces.



# Community Management & Monitoring Unit Distribution of surveyed water points

% of all water points surveyed



Province

Source: CMMU water point inventory  
Total no water points surveyed = 2,125

Chart 1



2. Water Points "In Use"\ "Not In Use"

The first analysis undertaken was to establish how many of the water points were either in use or not in use at the time of the survey. A water point was considered "in use" if people were actually drawing water from the source at the time of the survey or there was evidence that the source was being used by the community as may be indicated by spilled water etc. A source is considered "not in use" if there was no evidence of recent use i.e abandoned appearance, weeds, broken components etc.

Table 2 below indicates the percentage\number of water points in use\not in use by Province.

TABLE 2 : Water Points In Use\not In Use  
By Province

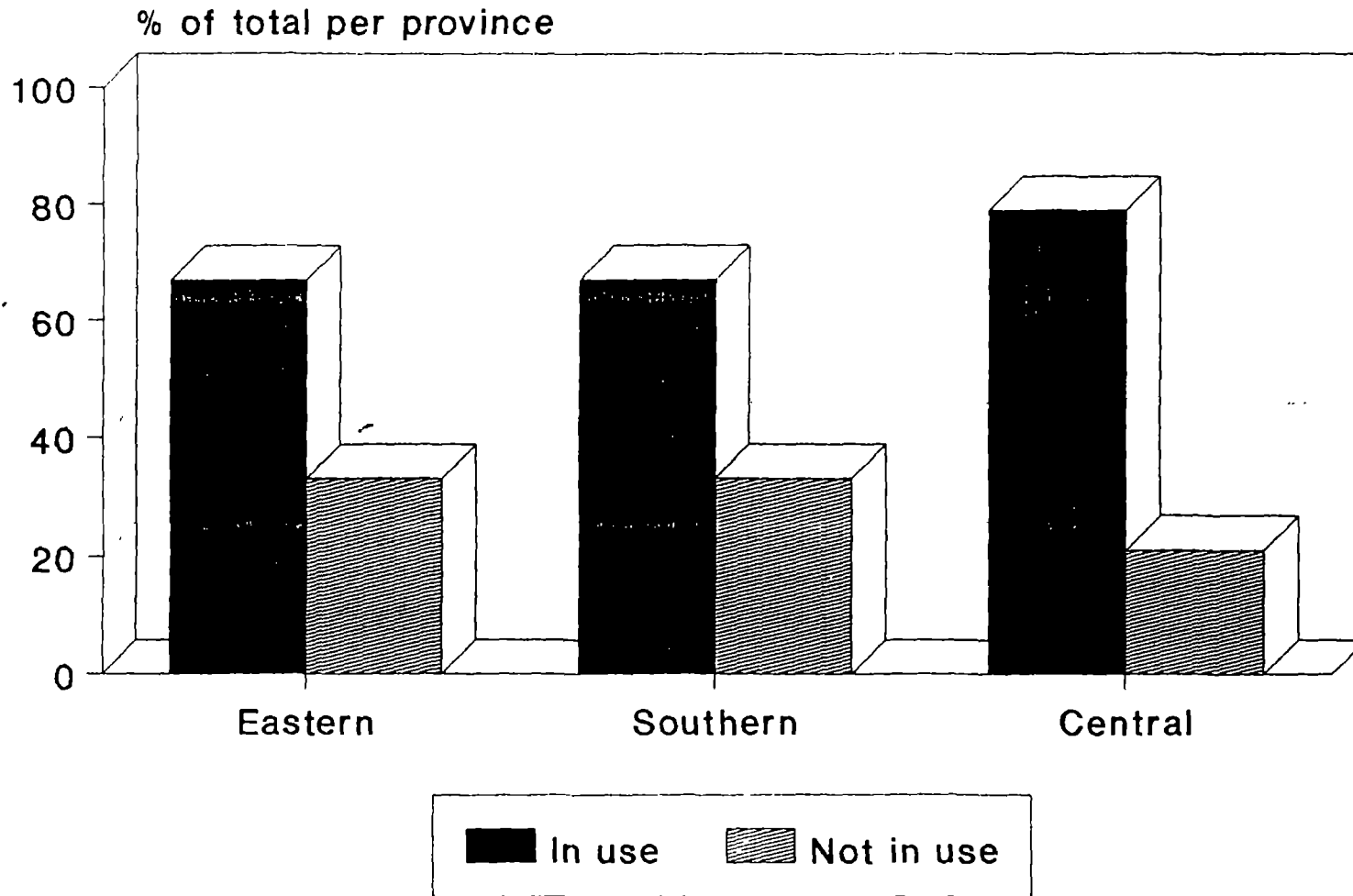
PROVINCE	IN USE	%	NOT IN USE	%
EASTERN	645	67	320	33
SOUTHERN	598	67	288	33
CENTRAL	216	79	58	21
TOTAL	1,459	68	666	32

Expressed as a percentage of the total surveyed in each province the number not in use in Eastern and Southern Provinces represents one third (33%) of all water points while this is slightly lower in Central Province being just above one fifth (21%). This may be due to the fact that there is greater intervention (maintenance) in Central Province. It is understood that Rural Water Supply (GTZ\JBG) have a fairly comprehensive maintenance programme. However, it must also be noted that the sample from Central Province is much smaller than that in the other provinces surveyed.

In all, the figures are considered optimistic. It is not unusual to find 50% - 75% of water points not working in similar situations in the region. However, it must be remembered that considerable effort was made during the drought relief efforts in Eastern, Southern and Central Provinces to rehabilitate old wells and construct new ones. This may account for the higher levels of usage than was previously expected.



Community Management & Monitoring Unit  
% of water points in use/not in use



Source: CMMU water point inventory  
Total no water points surveyed = 2,125  
Total number not in use = 666

Chart 2





3. Distribution Of Technology Types By Province:

Before we examine the performance of technology types in relation to in use\not in use it is proposed to plot the distribution of technology types by province. This distribution is given on Table 3 below:

TABLE 3 : Distribution of Technology Types by Province

TECHNOLOGY TYPE	EASTERN	SOUTHERN	CENTRAL	TOTAL	%
Hand Dug Well	824	510	138	1,472	69
B\Hole & H\pump	128	371	47	546	26
Hand Dug & H\Pump	12	4	87	103	5
Windmill	0	1	2	3	-
Protected Spring	1	0	0	1	-
TOTAL	965	886	274	2,125	100

A total of five technologies have been identified so far. These are :

- (a) Hand dug wells (bucket and windlass water lifting devices),
- (b) Boreholes with handpumps,
- (c) Hand dug wells with handpumps,
- (d) Windmills and
- (e) Protected springs

As can be seen from the Table Hand dug wells predominate representing a total of 69% of all water points surveyed. This is followed by boreholes with handpumps, 26%, and hand dug wells with handpumps 5%. The numbers of other technology types represents an insignificant portion of the total and therefore have been ignored in the analysis given throughout the rest of this report.

The distribution of technology types is very much area or province specific. This is clearer when one considers chart number 3 (next page) where the distribution of the technology types is illustrated graphically.

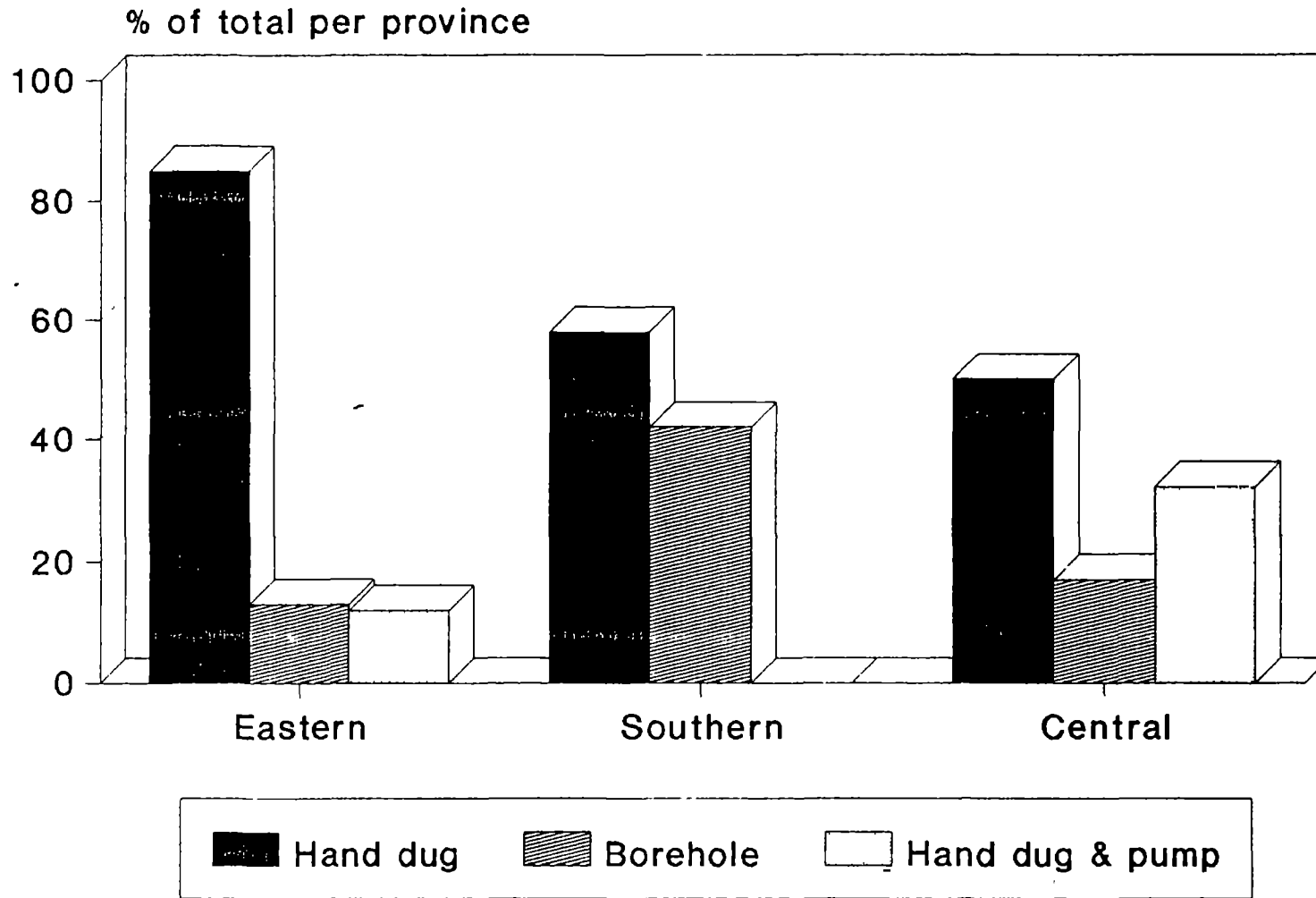
Hand dug wells predominate in Eastern Province, borehole with handpumps in Southern and hand dug with handpumps in Central.



Provincial variations are usually dictated by the ground conditions encountered. However, technology types can be greatly influenced by the individual projects working in the respective provinces. This is very much reflected in Chart No. 3, Central Province, where the interventions of Rural Water Supply (GTZ\JBG) who promote the use of hand dug wells with handpumps. To a lesser degree the interventions of DWA+JICA through a higher percentage of boreholes in Southern Province and LWF through hand dug wells in Eastern Province are illustrated.

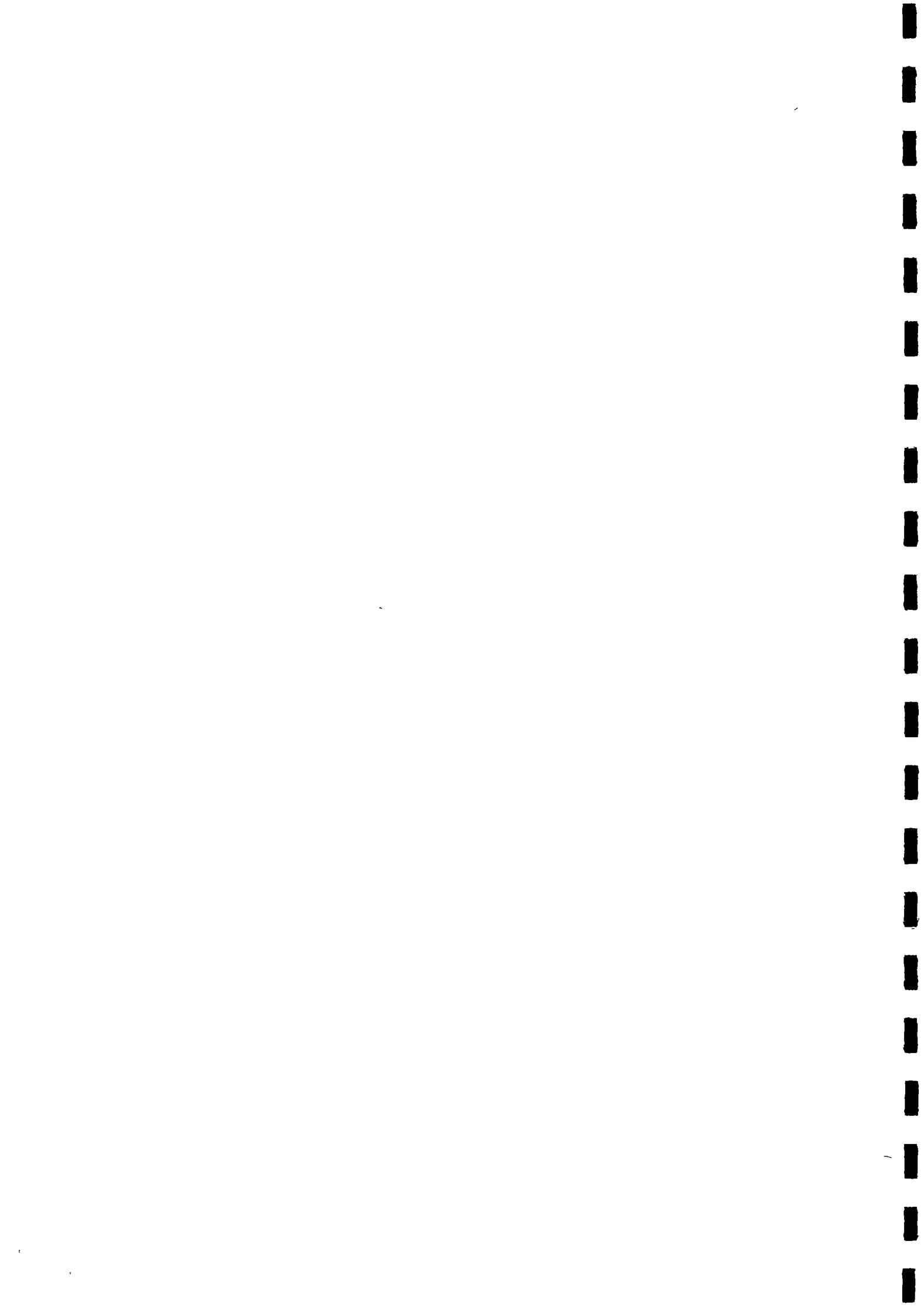


# Community Management & Monitoring Unit Distribution of technologies by province



Source: CMMU water point inventory  
Total no water points surveyed = 2,125

Chart 3



4. Performance of Technology Types (i.e. In Use\Not In Use)

The following table, Table 4, indicates the percentage of water points in use and not in use by technology. This table represents all water points surveyed in the three provinces earlier indicated.

TABLE 4 : Performance of Technology Types  
(In Use\Not In Use)

TECHNOLOGY TYPE	IN USE	%	NOT IN USE	%
Hand Dug Well	974	66	498	34
Borehole & H\Pump	399	73	147	27
Hand Dug & Pump	85	83	18	17
TOTAL	1,458	69	663	31

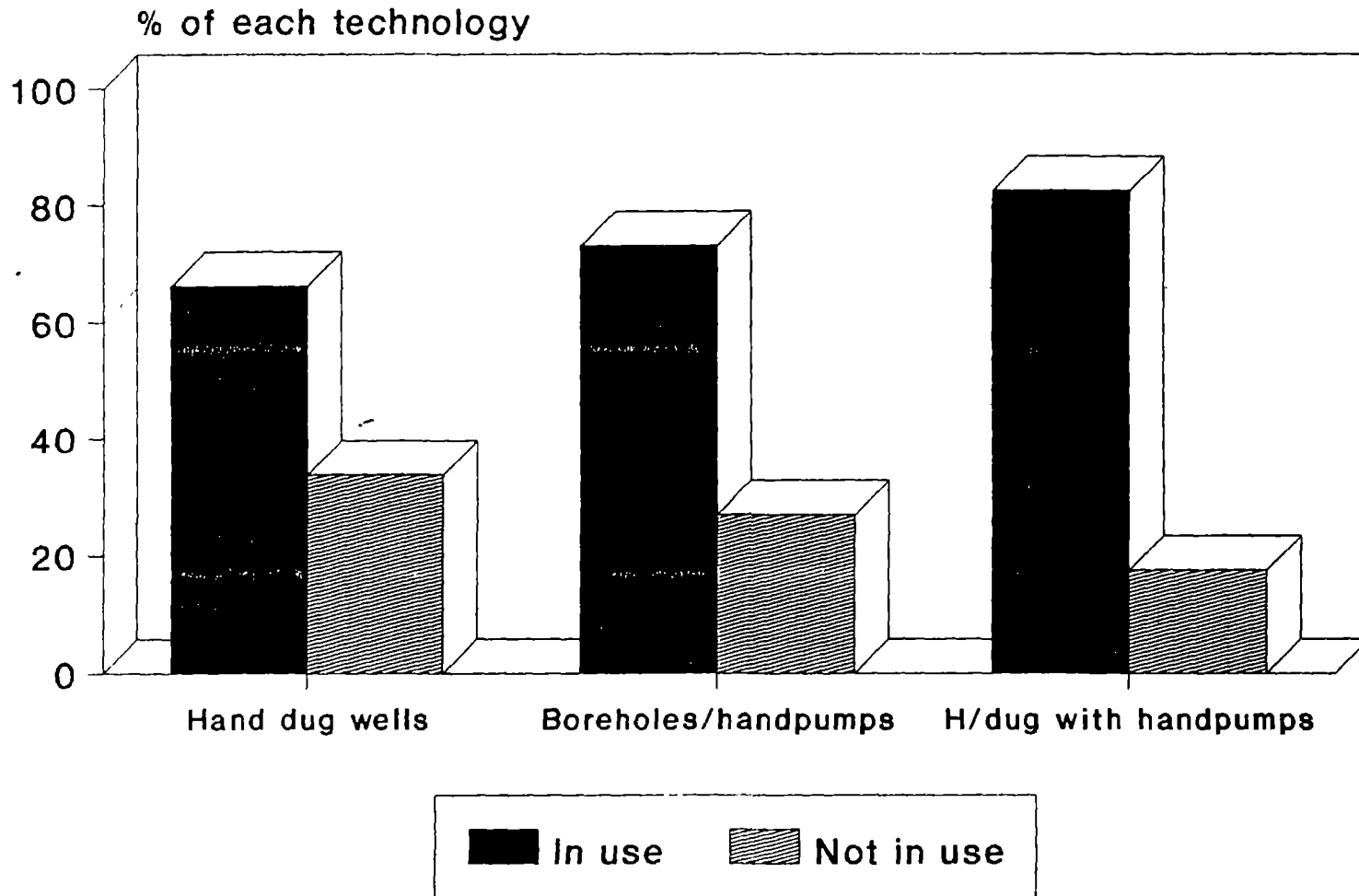
Hand dug wells with handpumps appear to perform best followed by boreholes with handpumps and then hand dug wells. 84% of hand dug wells with handpumps which have been located so far occur in Central Province. The reason for their better performance could be attributed to interventions from Rural Water Supply supported by GTZ\JBG and could possibly be due to drought interventions. Time may also be a factor as the pumps installed are relatively new. Furthermore this sample is small compared to other technology types.

Ground conditions and/or social/cultural conditions may also affect well use. This is examined in the next section.





Community Management & Monitoring Unit  
% in use/not in use by technology type



Source: CMMU water point inventory  
Total no water points surveyed = 2,125  
Total not in use = 666

Chart 4



5. Reasons Why Water Points Are Not Being Used

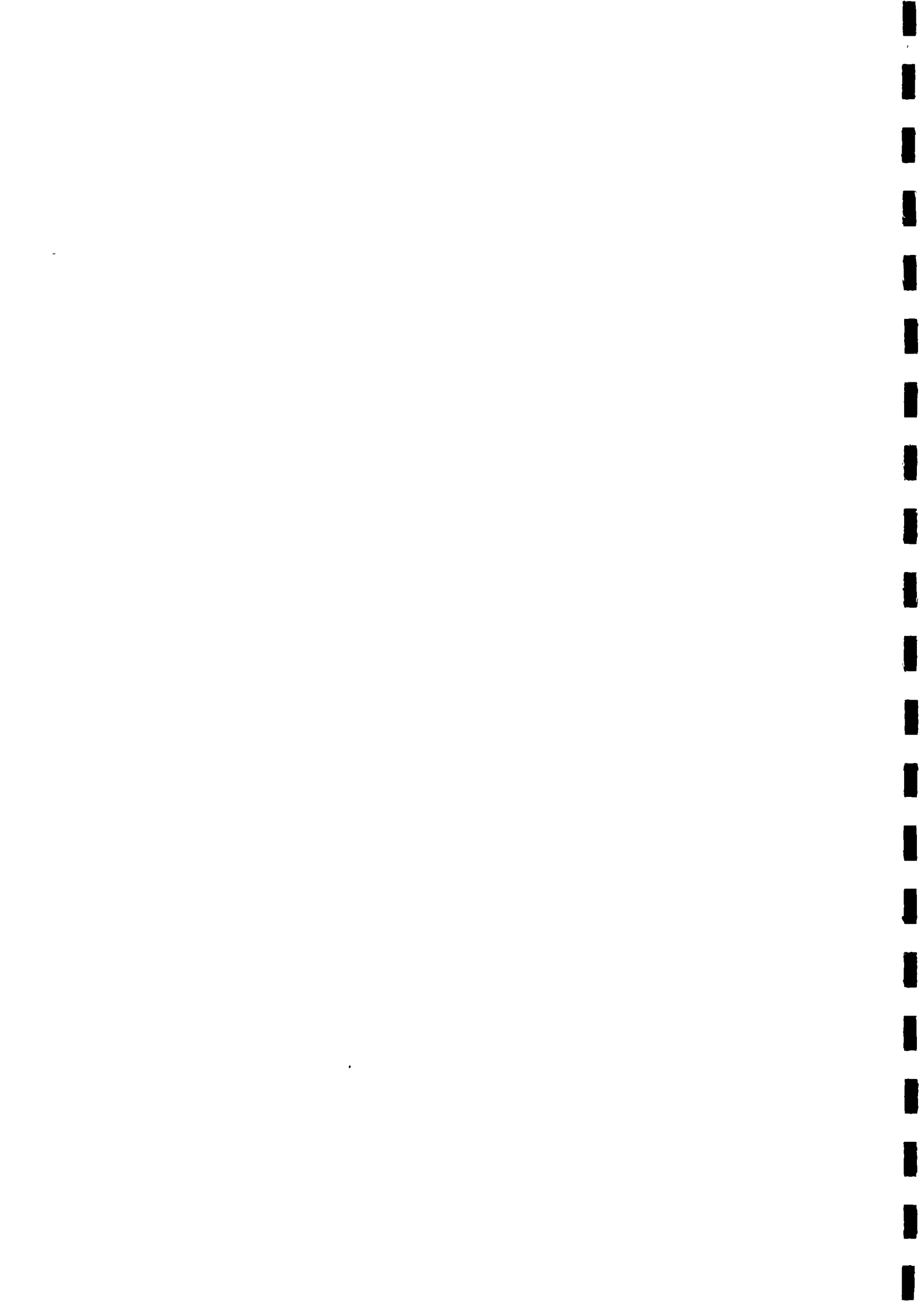
This analysis attempts to identify the reasons why water points are not being used. Prior to the commencement of the survey no attempt was made to categorise the possible answers into groups. However during analysis it became clear that it was possible to categorise these reasons and they were grouped as follows:

- (a) The water point has dried up.
- (b) The quality of the water is poor (as perceived by the users).
- (c) There is a problem with some components of the water point (i.e. bucket, windlass, pump etc) which prevents the well from being used.
- (d) Miscellaneous: This category includes "cat died in well", "madman threw animal hide in well", "well used as rubbish pit" or "well used as toilet" etc.
- (e) The water point has been abandoned i.e. the village has moved to another area, perhaps for cultural reasons.

The data presented below are divided into technology types.

TABLE 5 : Reasons Why Water Points Are Not In Use

REASON NON USE	H\DUG WELL		B\HOLE +PUMP		H\DUG + PUMP	
	NOT USED	%	NOT USED	%	NOT USED	%
DRY	262	52	5	3	5	28
QUALITY	66	13	2	1	0	0
COMPONENT	102	20	132	90	12	67
MISC.	41	8	6	4	1	5
ABANDONED	27	5	2	1	0	0
TOTAL	498	100	147	100	18	10

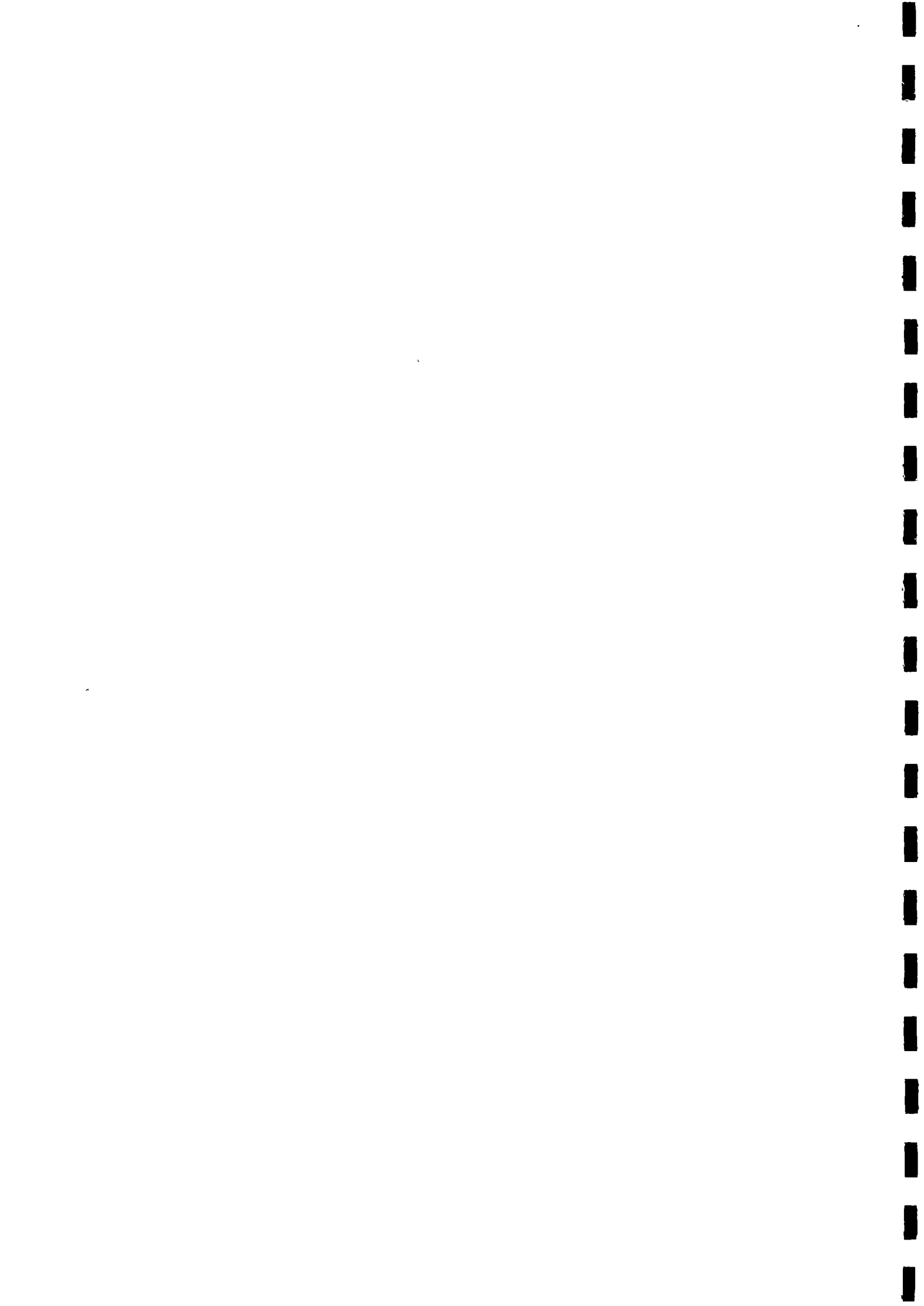


Examining the table by technology reveals that for hand dug wells 52% are not in use because they are dry, while 20% have problems with spare parts. A significant amount of respondents, 13%, suggest that water quality is a problem. This was often reflected in the questionnaire as "the water is muddy" or "the water tastes bad".

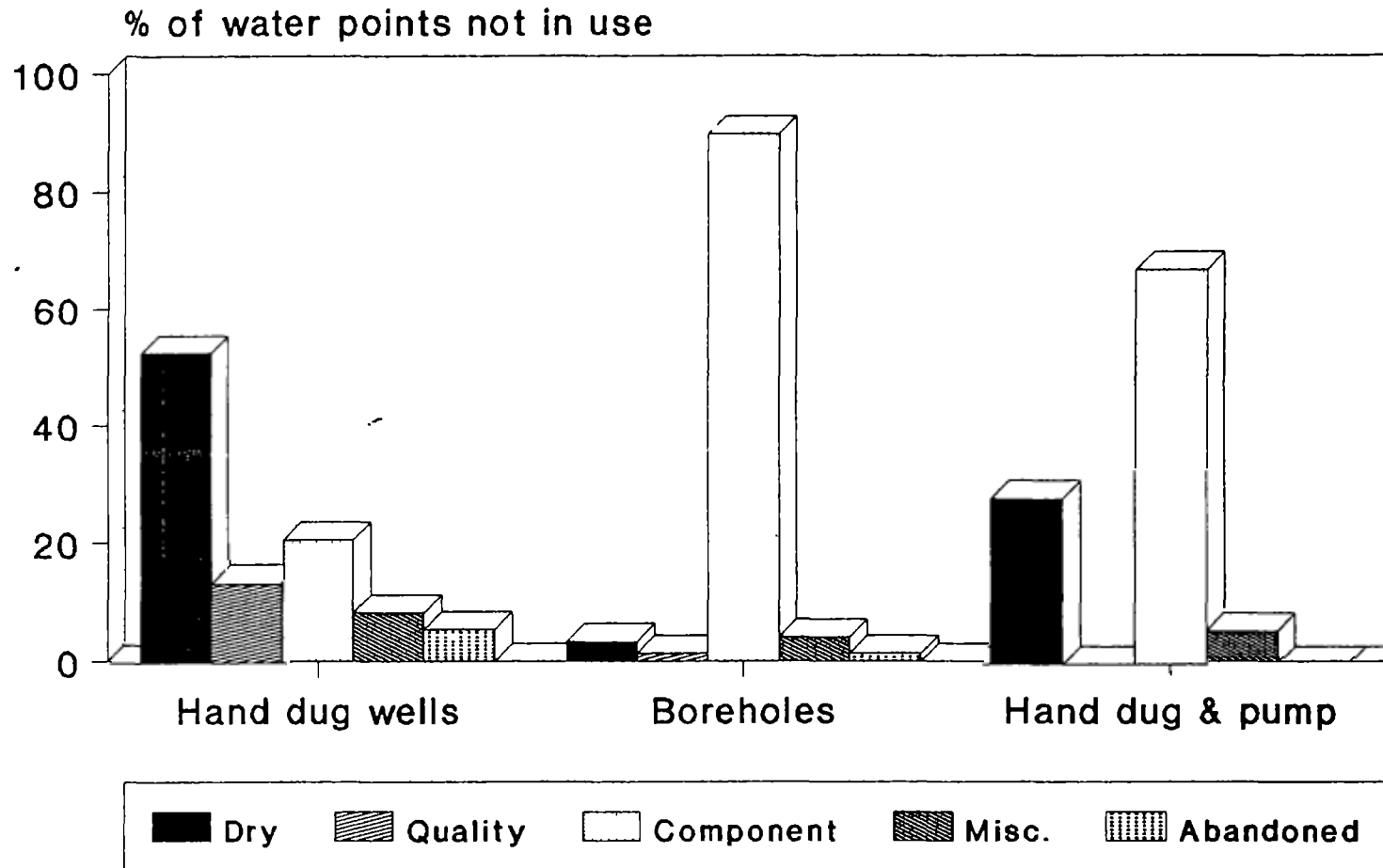
In the case of boreholes with handpumps the majority or 90% of the problems are related to the handpump (which is no surprise and is to be expected).

Considering Hand dug wells with handpump the major problem is again with the components (or the handpump). However, the figure of 67%(not in use) is significantly lower than for boreholes and this is consistent with the technology type. People are still able to use this technology even when the handpump breaks down. It is also interesting to note that quality is not a problem although it is important to remember that again the sample is much smaller than that for other technology types.

A short extract, from the well point inventory giving an example of the type of information which is available, and highlighting the reasons water points are not working (in use) in Mazabuka district is given in Appendix 2.

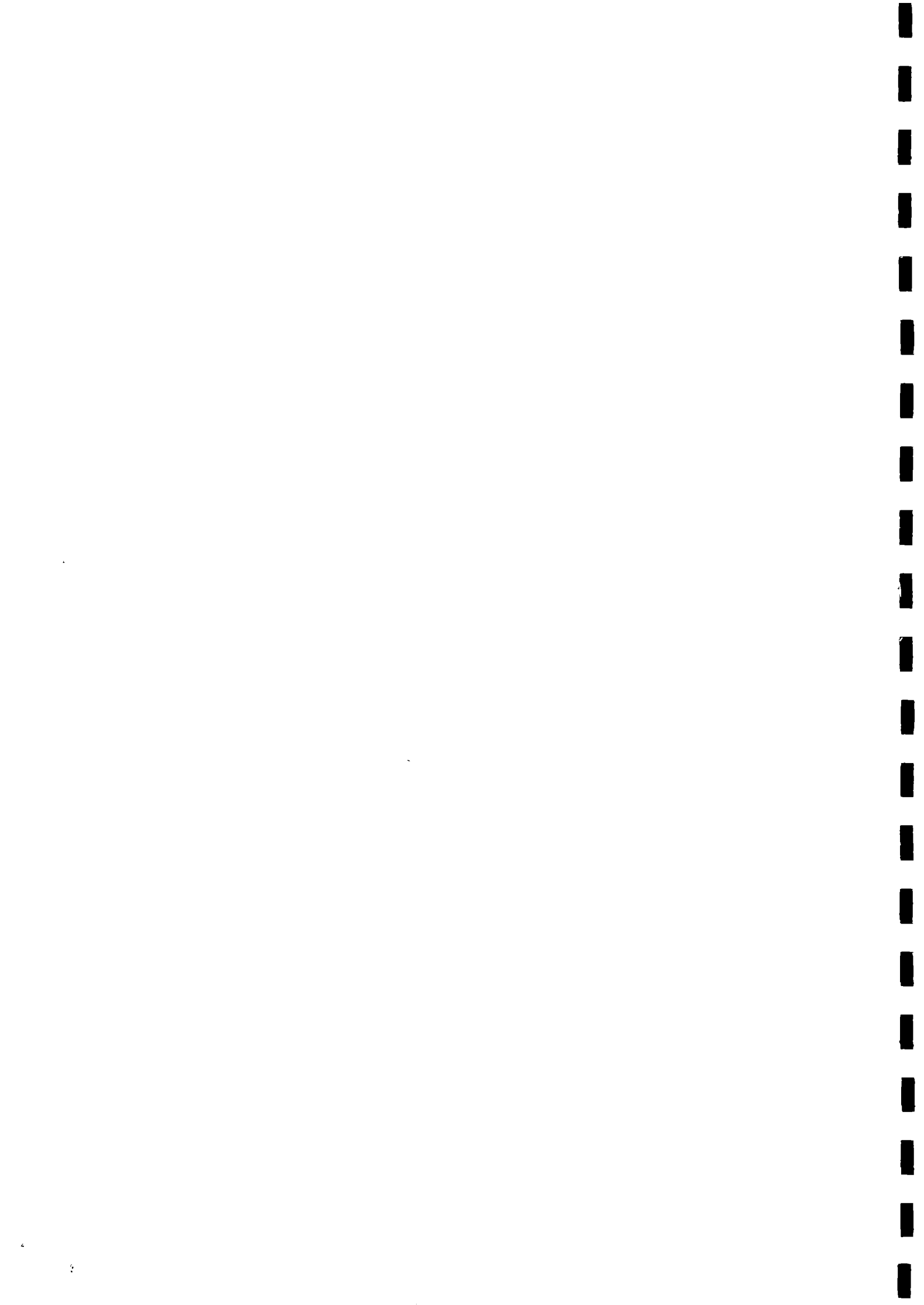


Community Management & Monitoring Unit  
**Reasons why water points are not in use**  
 (All districts EN, SN and CL Provinces)



Source: CMMU water point Inventory 1993  
 Total number surveyed = 2125  
 Total not in use = 666

**Chart 5**





6. Relationship between Village Well Committees and Water Point use.

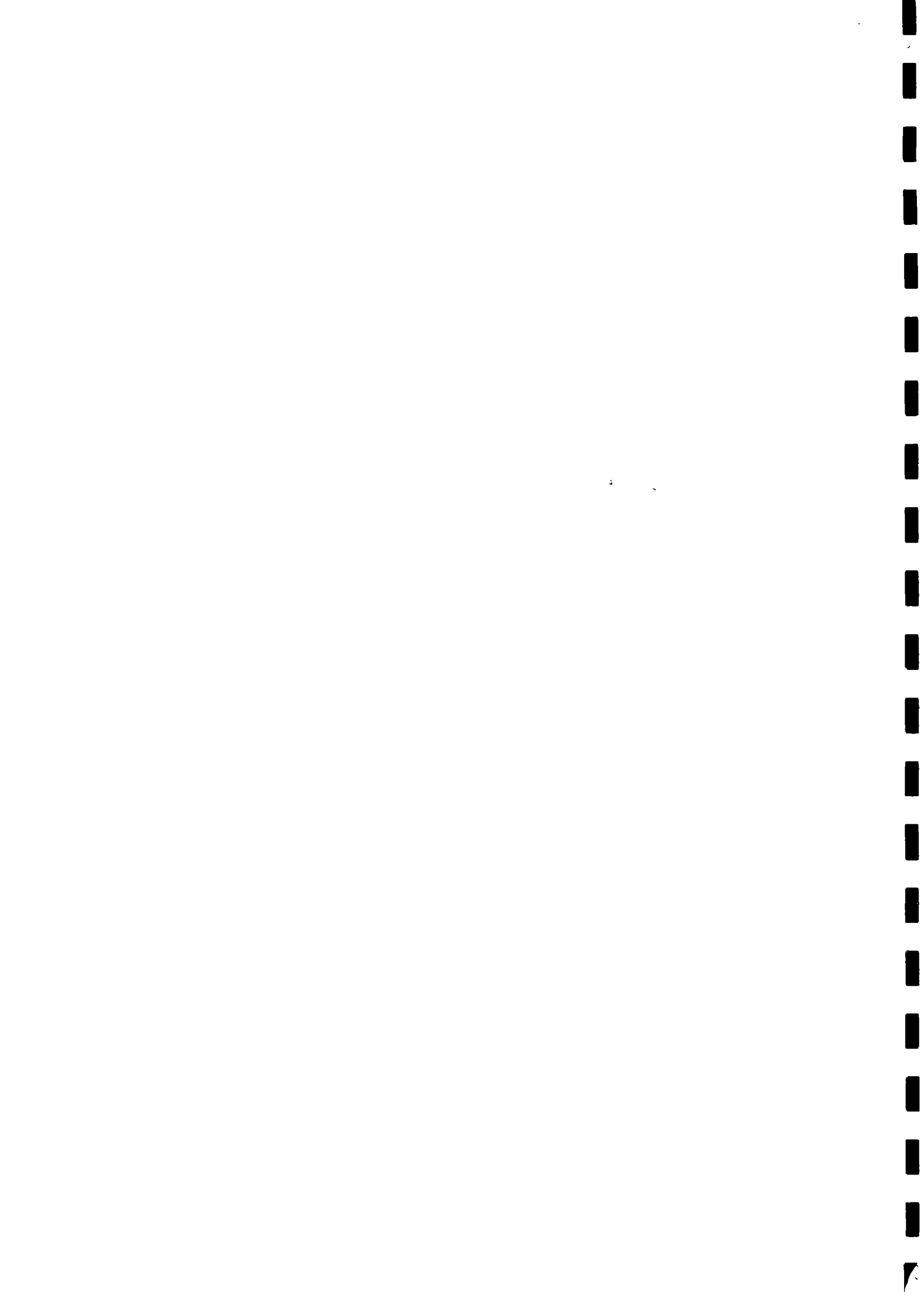
This analysis attempts to find a relationship between well use and village well committees, The assumption being that maintenance should be better where village well committees are in place.

Two parameters were examined, i.e. well in use and a village well committee in place and well in use and no village well committee in place. The results are indicated on Table 6 below.

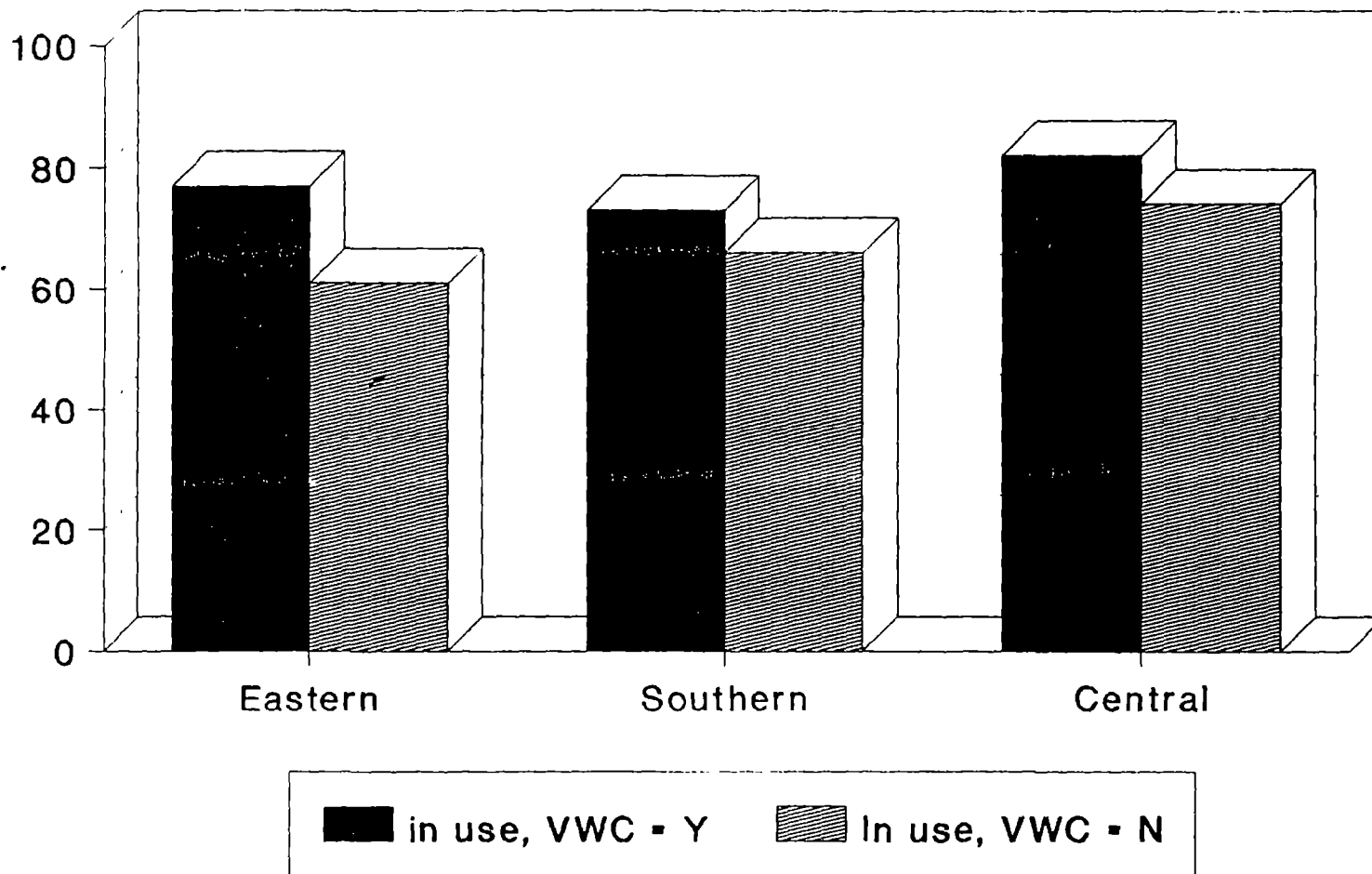
Table 6 : Relationship Between Well Use and Village Well Committee

PROVINCE	% IN USE VWC IN PLACE	% IN USE VWC NOT IN USE
EASTERN	77	61
SOUTHERN	73	66
CENTRAL	82	74
TOTALS	77	65

There does appear to be a small relationship between the existence of VWC's and well use and no VWC's and well use. However, wells may continue to function due to other interventions from outside the community and therefore these figures need careful interpretation. It is considered that this area needs further investigation.



Community Management & Monitoring Unit  
Relationship between village well  
committees (VWC) and water point use



Source: CMMU water point inventory  
Total no water points surveyed = 2,125

Chart 6



7. Conditions of Well Components

As an example it was decided to examine the individual components of hand dug wells in order to determine the major areas of concern in relation to their components. (This can also be carried out for other technology types). Strategies will have to be developed in order to alleviate some of the problems highlighted below

Table 7 indicates the percentage of components which are good, bad or missing for all hand dug wells which were surveyed.

Table 7 : Condition of Components of Hand Dug Wells

COMPONENT	% GOOD	% BAD	% MISSING
BUCKET	8	9	83
CHAIN	24	13	64
WINDLASS	38	14	52
POLES	49	32	19
LID	8	4	88
COVER	64	25	11
LINING	81	15	5
APRON	28	41	31
DRAIN	25	15	60
SOAKWAY	3	13	83

These figures speak for themselves. Many areas need attention, buckets, soakways, drain, lid, chain, windlass etc. Although these areas were known to be problem areas in the past these, results help to give an indication of the scale of the problem and areas requiring greatest attention.

The results of this element of the inventory need discussion and debate. However, it would appear that the technologies employed (or the use of these) needs improving. Almost 90% of all respondents suggest that user problems are technology related which has been supported by and large in this previous section.

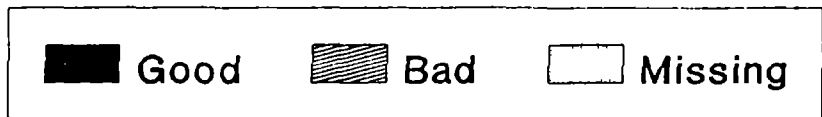
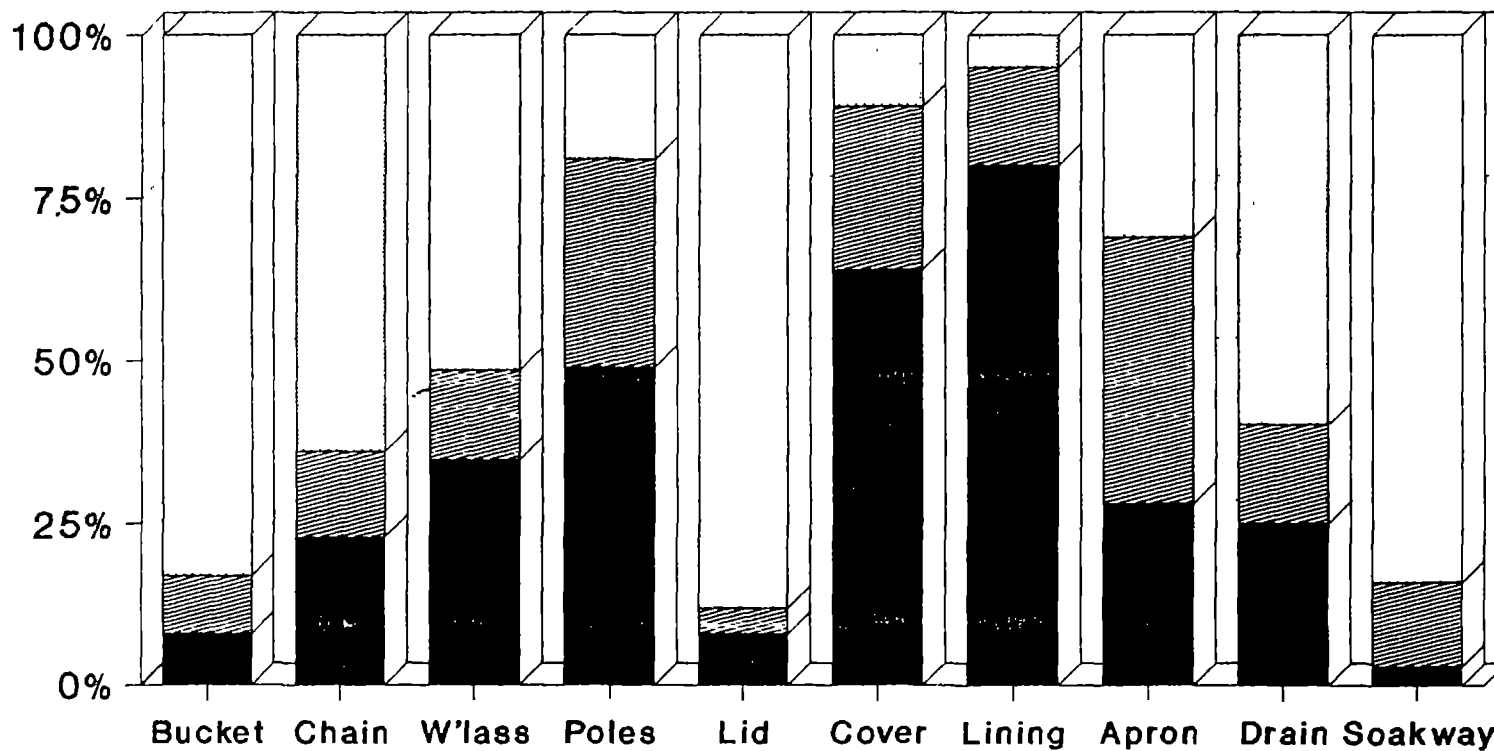
It is necessary therefore to develop strategies which will address

- a) the technology itself (i.e improve bucket quality or look for alternatives)
- b) improve extension efforts in relation to use
- c) improve user understanding



Community Management & Monitoring Unit  
**Condition of well components**  
 Hand dug wells (EN, SN & CI provinces)

condition as % of hand dug wells



Source: CMMU water point inventory  
 Total no of hand dug wells n = 1,472

**Chart 7**





8. User Perceptions in Relation to Problems Associated with their Water Points

All respondents were asked whether or not they had a problem with their water points. The responses given were classified under the following headings:

- 1) Technical
- 2) Social\Cultural
- 3) Economic
- 4) Other

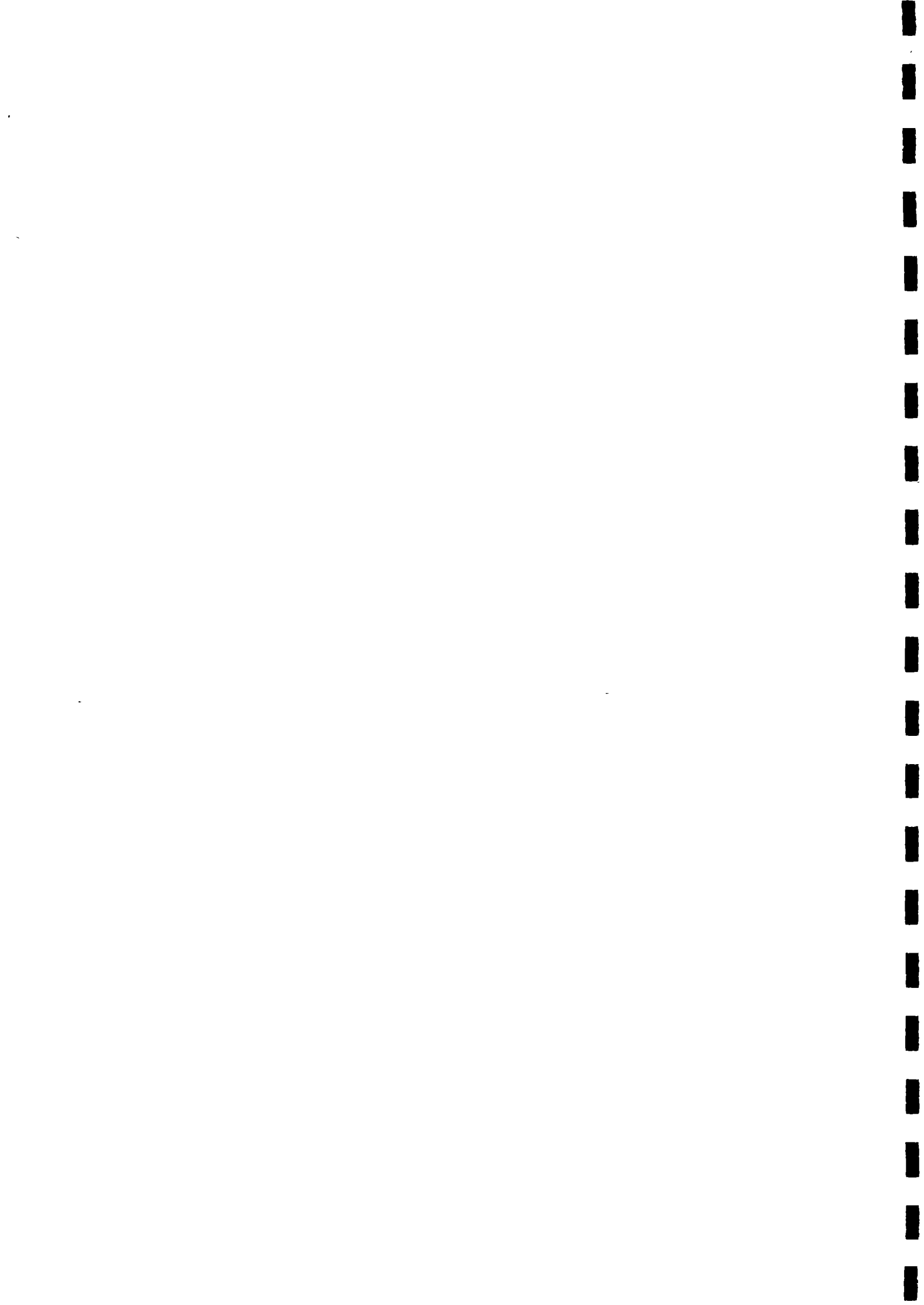
The results obtained are given on Table 6 below.

Table 6: Problems with Water Points as Perceived by the Users in % of Total Surveyed

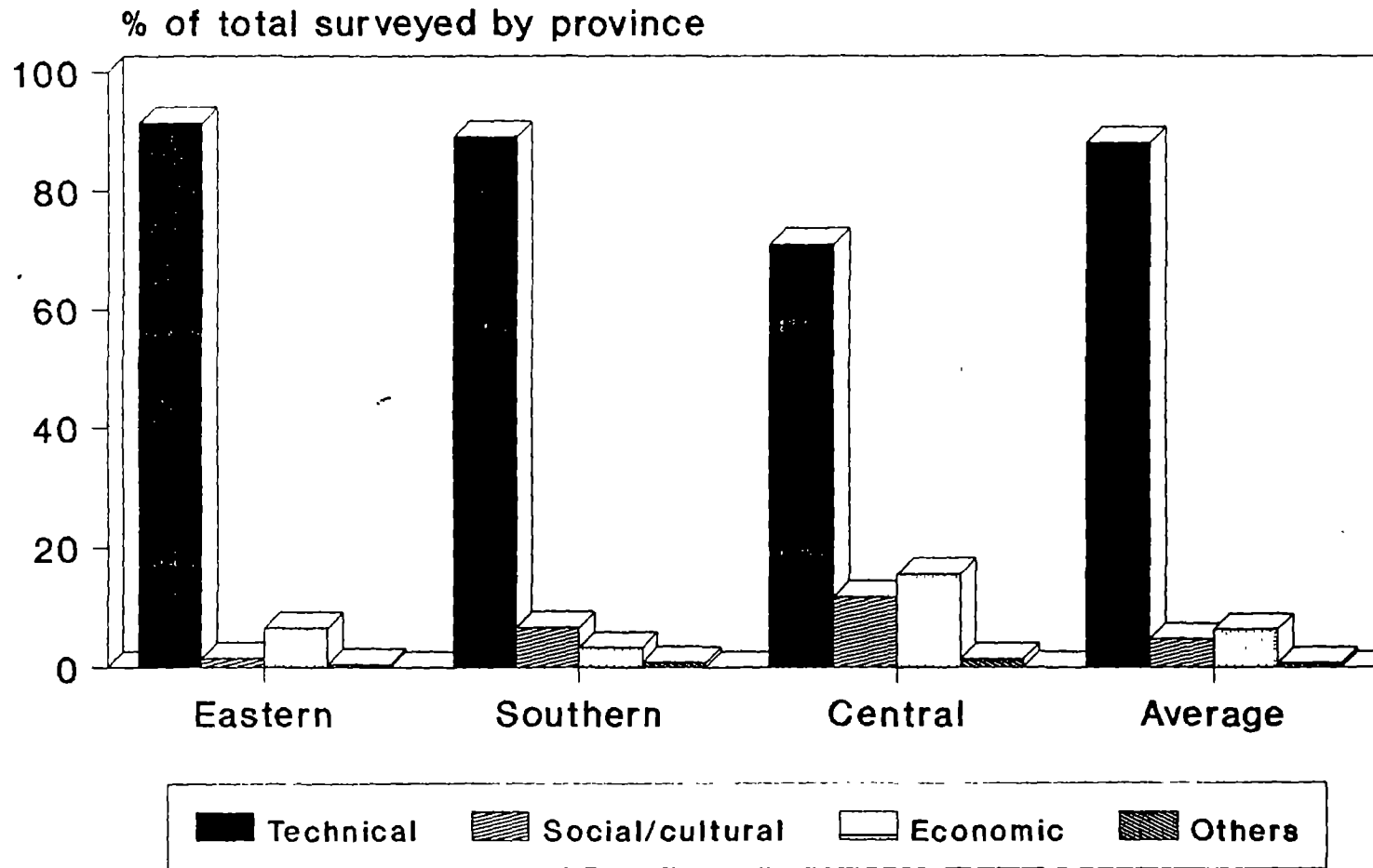
PROVINCE	% PROBLEMS TECHNICAL	WHICH ARE:- SOCIAL\CULTURAL	ECONOMIC	OTHER
EASTERN	91.4	1.5	6.6	0.6
SOUTHERN	89.1	6.7	3.3	0.8
CENTRAL	71.0	11.8	15.6	1.4
TOTAL	88.1	4.8	6.4	0.7

By far the greatest problem with water points as perceived by the Users are of a technical nature. However, one must be careful when interpreting these results. If a respondent says that the community has no money to replace the broken windlass, is this a technical problem (because the windlass is broken) or is it a social problem (no organised structure in the community to raise funds) or is it an economic problem (no money)? In the majority of cases however, respondents were confident as to the source of the problem. It is considered that the results given here are representative of respondents perceptions in relation to problems pertaining to water points.

Here again it is interesting that respondents in Central Province have less of a problem with technical matters than in the other provinces.



Community Management & Monitoring Unit  
 Problems with water points  
 as perceived by the users



Source: CMMU water point Inventory  
 Total no water points surveyed = 2,125

Chart 8



9. Water Use

The following Table indicates the major purposes for which the water points are used.

Table 9: Water Use

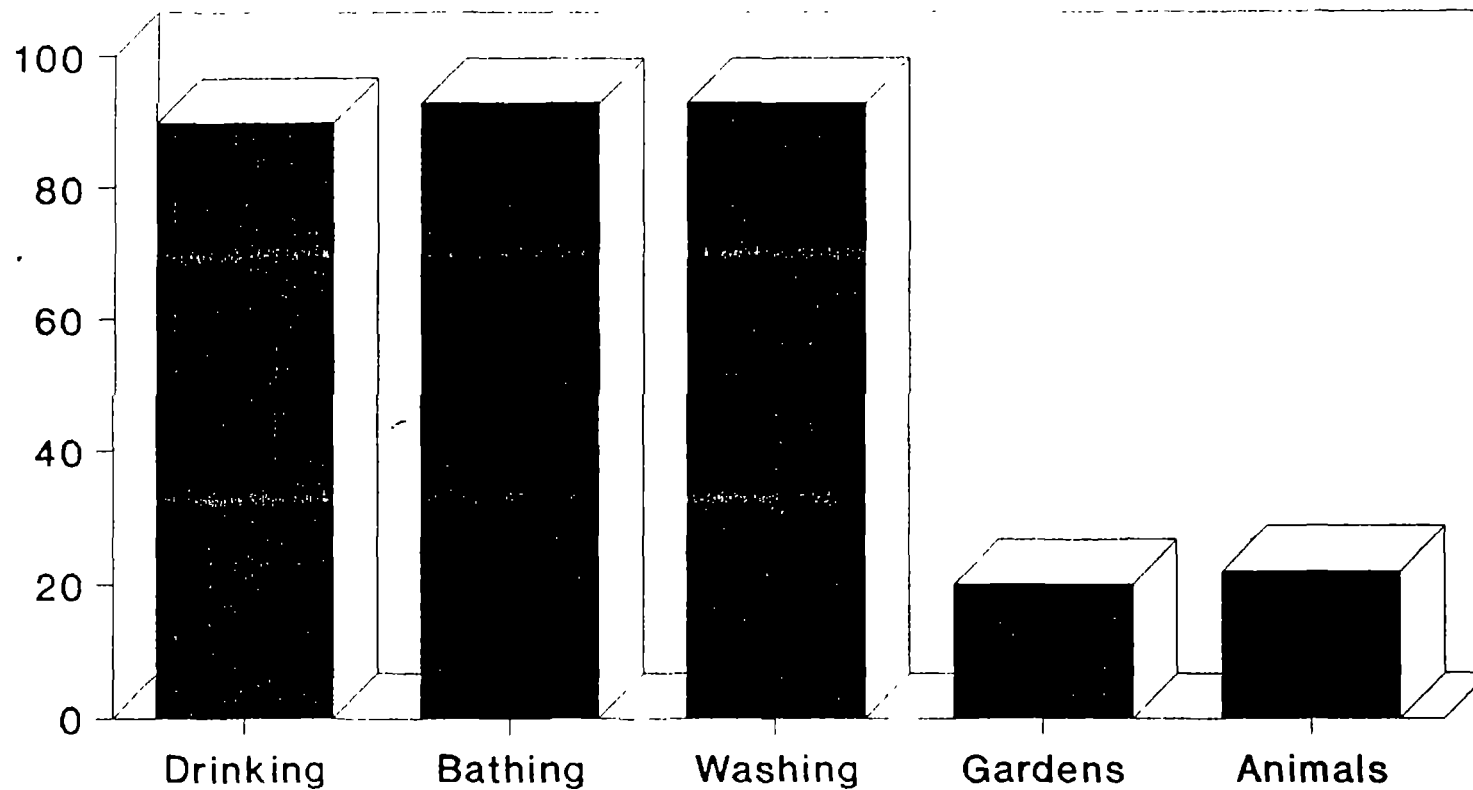
PURPOSE	% OF TOTAL SURVEYED
DRINKING	90
BATHING	93
WASHING (CLOTHES ETC)	93
GARDENS	20
ANIMALS	22

This Table is self explanatory and reflects trends from other areas of Zambia. Particularly for drinking, washing and bathing. Water used for animals is considered region\culture specific although the extent of this has not as yet been established from the inventory. There are other uses for which the water points\water are used, most notably among these is brickmaking. Again the extent of this has not been calculated yet from the data base.



Community Management & Monitoring Unit  
Water use, all provinces

% of total surveyed in each category



Water use

Source. CMMU water point inventory  
Total no water points surveyed = 2,125

Chart 9





Appendix 1



COMMUNITY MANAGEMENT & MONITORING UNIT

Rural Water Supply - Water point inventory (2nd draft)

(Part I)

Province: \_\_\_\_\_ District: \_\_\_\_\_ Date: \_\_\_\_\_

Ward: \_\_\_\_\_ Chiefs Area: \_\_\_\_\_ Time: \_\_\_\_\_ Hrs

Village: \_\_\_\_\_ W/Point name: \_\_\_\_\_

Alternative Village name: \_\_\_\_\_

Location: South: 

--	--	--	--	--	--	--	--

East: 

--	--	--	--	--	--	--	--

WATER POINT DETAILS

Hard dug well      Tubewell      Jetted well      Bolehole

D&W

D&W

H/Pump

H/pump

H/Pump

H/Pump

Total depth: 

--	--	--	--

Depth to Water: 

--	--	--	--

Type of Lining:  C/S  PC

1/5 of well: 

--	--	--	--	--

m m y y

Date well completed: 

--	--	--	--

By whom:  CP + 

--	--	--	--

Is the well currently in use  Y  N if not why \_\_\_\_\_

(Part II)

In the case of a handpump

a) Has it ever been repaired  Y  N

m m y y

b) When was the last time it was repaired 

--	--	--	--

c) Since installation how many times has it been repaired

--	--

 (please state number of times repaired)

d) Who did the last repairs  CP + 

--	--	--	--



In the case of a hand dug well

a) Has it ever been rehabilitated  Y  N

b) When was the last time it was rehabilitated          
m m y y

c) Who did the last rehabilitation  CP +

d) How many times has it been rehabilitated since construction  
  (Please state number of times rehabilitated)

What works were carried out the last time  
Repairs/Rehabilitation was undertaken

REPAIR REPLACE

	REPAIR	REPLACE
BUCKET		
CHAIN		
WINDLASS		
POLES		
LID		
COVER		
APRON		
DRAIN		
SOAKAWAY		
HANDPUMP		

(Tick where appropriate)

Has the well ever been deepened  Y  N

Does it ever go dry  Y  N When: \_\_\_\_\_

Is there another reliable protected source nearby  Y  N

Distance   time in minutes.



(Part III)

WATER QUALITY

Are users happy with the water quality

Y	N
---	---

If not why? \_\_\_\_\_

Which R.H.C dc Users go to for treatment \_\_\_\_\_

Has there been a health education programme in relation to this well

Y	N
---	---

Does it still continue

Y	N
---	---

Is there a village water/sanitation committee:

Y	N
---	---

Who prompted the formation of the village water/sanitation committee?  
\_\_\_\_\_

Does it still function

Y	N
---	---

CONTACT NAME: \_\_\_\_\_

Population

--	--	--	--	--	--

Number of houses

--	--	--	--	--	--

General Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





(Part IV)

Condition of water point components

Hand dug/Tube well

COMPONENTS	G	B	M
BUCKET			
CHAIN/ROPE			
WINDLASS			
POLES			
LID			
COVER			
LINING			
OTHER			

COMPONENT	G	B	M
APRON			
DRAIN			
SCAKWAY			
OTHER			

Tube/Jetted/Bolehole/Handdug

Pump type:			G	B	M
WORKING ORDER	Y	N			
Number of Strokes to fill 10L bucket					
= <input type="text"/> Strokes					
Number of strokes to Resume water delivery 2min after pumping stopped					
= <input type="text"/> Strokes					
NUTS					
HANDLE					
BEARING					
Pump not working but no vissible fault					Y

WATER USE	
Drinking	<input type="checkbox"/> Other <input type="checkbox"/>
Bathing	<input type="checkbox"/> (specify)
Washing	<input type="checkbox"/>
Gardens	<input type="checkbox"/>
Animals	<input type="checkbox"/>

Is the Well located in the village  Y  N Distance  (Time)

Do users have problems in relation to this Well  Y  N

Technical	Socio/Cultural	Economic	Other

SURVEYOR: .....  
(Block)



Appendix 2

