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NORWEGIAN INSTITUTE FOR WATER RESEARCH
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A WATER PRICING STUDY FOR THE REPUBLIC OF ZAMBIA

Appendix II

WATER USE AND WILLINGSNESS TO PAY SURVEY
NORTHERN AND LUAPULA PROVINCES

NIVA
Bergen, October 1983
Mette Jørstad, Social Anthropologist

LIST OF CONTENTS

P R E F A C E

The Norwegian Institute for Water Research (NIVA) was in March 1981 engaged by the Norwegian Agency for International Development (NORAD) to undertake a Water Pricing Study for the Western Province of Zambia.

The report including the recommendation for a new water tariff structure for Western Province was presented in October 1981.

The Department of Water Affairs (DWA), however, felt that a National Study was required in order to establish a National Water Tariff Structure.

NORAD agreed to finance the extension of the Study and a Contract between NORAD and NIVA was signed in September 1982.

The same Project Team as for Western Province was used. However, the team was extended by one water engineer.

The Project Team consisted of:

Mr. David G. Browne, Agricultural and Water Resources Economist
Mrs. Mette Jørstad, Social Anthropologist
Mr. Torbjørn Damhaug, Water Engineer
Mr. Svein Stene Johansen, Project Manager

The two latter are permanently employed by NIVA, the two other persons hired as sub-consultants.

The Project Team visited Zambia in August-December 1982 and had discussions with relevant authorities at central, provincial and local levels. The team also met members of the Department of Water Affairs (DWA) staff as well as many water consumers.

In order to provide data for the main report and NIVA's recommendations to the Zambian Government, socio-economic surveys covering various topics which have a bearing on consumer's ability and willingness to pay were carried out by the economist and the socialanthropologist. Both surveys

are based on the same questionnaires and methodology. These surveys were meant to be independent studies at the responsibilities of the authors. The result of the surveys are presented at Appendix I and II to the main report.

Svein Stene Johansen
Project Manager

1. INTRODUCTION

1.1 Purpose

In order to provide data for this report the consultants carried out a socio-economic survey covering various topics which have a bearing on consumers' ability and willingness to pay for alternative levels of water service.

1.2 Questionnaires

The questionnaires used in the survey were based on those prepared by Lottie and Associates for their socio-economic work in Northern and Luapula provinces. The consultants modified and added to the original questionnaires in order to increase their usefulness for this report. The intention was to enable the consultants to use the earlier data in addition to their own in order to obtain a wider sample. This has been done where possible. Unfortunately, due to the limited amount of data presented in Lottie's report the scope for comparison was restricted.

The final questionnaires were presented to DWA and NORAD in the Work Plan (October 1982). Two different questionnaires were used for different groups of consumers.

A "high service" questionnaire was designed for the consumers who have their private connection or their individual standpipe. They are referred to as the high service consumers. Within this category a distinction is sometimes made between high, medium and low cost housing consumers. In practice there is a close correlation between high service and high and medium cost housing. There is, however, some low cost housing residents who fall into the category of high service in connection with water supply.

The second questionnaire was designed for the "low service consumer group" which is the part of the population who use public standpipes or traditional sources, including hand dug wells and streams. Parts of the interviews were common for all groups of consumers.

1.3 Survey in Northern and Luapula Provinces

The survey took place during 6 weeks in October and November 1982.

A summary of the sample interviews is presented in Table 1.1.

Table 1.1.

	Technical	Administrative Economic	Consumers High serv.	Consumers Low serv.
Southern Province:				
Chirundu	1			
Lusitu	1			
Siavonga	1	1		
Northern Province:				
Mbala	2	1	12	36
Kasama	1	3	34	33
Misamfu	1		39	
Kaputa *	1			
Isoka *	1			
Nakonde *	1			
Mporokoso	1	1	9	9
Nseluka	1			12
Luwingu	1	1	9	
Luapula Province:				
Nchelenge	1	1		
Kashikishi	1	1		12
Kawambwa	1	1		7
Total	16	10	103	109

* These places were not visited, but the respective Water Operators were interviewed during a meeting in Kasama.

The interviews in connection with the technical, economic and administrative data were performed by the anthropologist. Two enumerators were recruited and trained for consumer interviews in Kasama and Misamfu, one enumerator for Mbala and one who travelled with the anthropologist to the rest of Northern and Luapula Provinces. Their overall performance was satisfactory, considering the limited time of training and supervision.

1.4 Sampling

No formal sampling procedures were followed, but an effort was made at obtaining equal numbers of low service versus high service samples. Also, in Kasama, Misamfu and Mbala where the samples are relatively large, a socio-economic stratification of the sampling was obtained through defining in advance which parts of the townships/ localities were to be visited, and for how many interviews. As is usual in such townships, a socio-economic stratification correlates with a geographic stratification.

The townships are known to the informed reader. Nseluka is a large re-grouped village on the Great North road about 20 km north of Kasama. Misamfu is an Agricultural Research Station about 5 km north of Kasama.

The present paper is a report on the findings of the consumer interviews

1.5 Category of Housing

In Zambia there are defined criteria for calling houses of statal and parastatal employees high, medium or low cost. The various ranks of employees make them entitled to a certain category of housing. However, due to the shortage of staff housing in most areas, high ranking employees do not always live in high cost houses, and the same goes for medium and low rank employees. It is not known to what degree there now is a correlation between any given rank living in the corresponding housing standard. A few cases of even high ranking employees living in low cost houses was observed during the survey, and not infrequently government employees of some rank have to find their own accommodation in traditional houses in the compounds.

In designing new or improved water supplies, different consumption criteria are used for the different housing categories. It is furthermore assumed that ability and willingness to pay for water will vary according to housing categories. Therefore the housing category of the interviewees was recorded.

Table 1.2

Places included in the survey	Number of houses		Number of rooms	
	Housing categories			
	High/medium	Low	High/medium	Low/Trad.
Kasama	32	2	7	5
Misamfu	25	14	8	2.5
Mbala	12	-	9	-
Mporokoso	9	-	4.5	-
Luwingu	9	-	6	-
Total	87	16	34.5	7.5
Percentage	84	16	34.5	7.5

In high/medium cost houses there is an average of almost 7 rooms, but as will be seen from the table the distribution is from an average 4.5 rooms in Mporokoso to an average of 9 in Mbala. The average number of rooms in the low cost and traditional housing category is approximately 3.

2. HIGH SERVICE SURVEY

2.1 Family Size

The number of persons in the sample households were investigated and the results are presented in Table 2.1 below.

Table 2.1. Size and composition of high service consumer households.

	Number of households	Total children	Total adults	Total persons	Average children/ household	Average adult/ household	Average number of persons	Percentage of children
Kasama	34	132	97	229	3.8	2.9	6.7	58
Misamfu	39	152	112	264	3.9	2.9	6.8	58
Mbala	12	82	66	148	6.8	12.3	12.3	55
Mporokoso	9	34	21	55	3.8	2.3	6.1	62
Luwingu	9	50	17	67	5.5	1.9	7.4	75

The percentage of children per household are in some cases extremely high. There does not seem to be a correlation between the average number of rooms in houses and number of children. It is assumed that a portion of the children belong to other members of the extended family, and that they are sent to towns to be educated. The variations in the sample of percentages of children per household are assumed to be associated with the opportunities of education, or rather the lack of such opportunities in some of the sample areas.

2.2 Level of Water Service

In the sample of high service consumers a total of 76 households have multiple tap houses. The remaining 17 households have a single tap and ablution block facilities, usually containing toilet, shower and wash-basins, and usually shared by two low-cost houses. 15 of this latter category belong in the Misamfu sample, where almost 40 percent of the sample consists of low cost housing residents with high level service.

2.3 Installations

84 (81%) households had an out-door tap, kitchen tap, bath and/or shower and toilet. 19 households had access to ablution blocks shared by 2 families, and 1 household had a single tap.

2.4 Leakage

The number of households having leaking taps was investigated, and the enumerators were asked to measure and estimate leakage. The number of leaking taps is probably accurate, but it is felt that less reliability should be granted the volume of leakage per day.

Table 2.2.

	Number of leaking taps	Leaking taps averaged per household %	Total leakage litres/day
Kasama	17	50	1020
Misamfu	32	82	7200
Mbala	11	122	6000
Mporokoso	1		little
Luwingu	3		Unspecified

There seems to be great variance in maintenance standard between the different survey areas. Although leakage is a significant loss, it is reasonable to assume that the watering of gardens may represent far more significant amounts. For this purpose the taps are often left fully open 24 hours per day, and especially during the dryer periods of the year.

Table 2.3.

	Number of households watering garden	Percentage of households watering garden
Kasama	28	82
Misamfu	28	77
Mbala	6	50
Mporokoso	7	77
Luwingu	2	22
Total	71	60

Apart from normal use of water for consumption and washing, the use for gardens is the only major extra consumption. In these township areas the proportion used for animal consumption is negligible, and so is the proportion used for brick-making, mudding etc.

2.5 Consumer Complaints

Table 2.4.

	Colour, taste	Intermittent or unreliable service, low pressure	No complaint	Factor of complaints
Kasama	16	33		1.45
Misamfu	29	35	1	1.65
Mbala	6	12		1.50
Mporokoso	11	7	2	0.90
Luwingu	11	9		1.10
Total	70 %	93 %	3 %	1.32

The highest factor of complaints is found at Misamfu, which probably has the best service in the whole sample. Not only is water provided free of charge, but it is significantly more reliable than in most areas. Intermittent service is unfrequent and only occurs during rainy season when power is cut by lightning. However, reticulation is by gravity from filters and the Station will often provide pumping capacity to the filters via a tractor, if the electricity is cut off for long. When the informants voice these complaints, they imply that their health is threatened because the water is not treated. They are very preoccupied with treatment.

The sample does not represent 100 percent, since several households had more than one complaint.

2.6 Storage

Table 2.5. Storage of water

	Household storing Number	Water storing Percentage
Kasama	28	82
Misamfu	21	53
Mbala	12	100
Mporokoso	8	88
Luwingu	6	66

As will be seen, there is not always a correlation between the factor of complaints about unreliability of service and water storing. On this issue Mbala and Luwingu both have a complaint factor of 1 (the two highest), but in Luwingu only 66% of the households store water. Mporokoso has the lowest factor of complaint on this score (0.7) but has the second largest percentage of storing. Since a fairly high correlation would be expected, it is possible that one or both questions are not valid. A great majority of the vessels used for storing were, according to the answers, wide-necked or very open ones which permit the water to be easily polluted from dust, animals and playing children.

2.7 Employment

Table 2.6. Numbers of households having employed members.

Employment:	1 person permanent	1 person occasional	2 persons permanent	1 person permanent 1 person occasional	N/A	Factor of permanent employment
Kasama	27		2	1	4	
Misamfu	33	1	2	1	1	
Mbala	8		2			
Mporokoso	8		1			
Luwingu	8		1			
Total	84	1	8	2	5	1

2.8. Incomes

In order to provide basic data for the ability to pay for water exercise, interviewees were questioned about their sources and level of income. Direct questioning about incomes is usually surrounded by difficulties, and about 50 percent refused to answer the question. Among these were a number of the higher eschalon politicians and administrators in statal institutions.

Table 2.7. Incomes from employment.

	Number of households in sample	Mean Incomes	Median Incomes	No answer
Kasama	34	K 260	K 195	9
Misamfu	39	K 211	K 95	18
Mbala	12			11
Mporokoso	9			7
Luwingu	9			6

Due to the unwillingness to answer the question about incomes from employment (80 percent) in Mbala, Mporokoso and Luwingu, the sample has become too small to treat statistically. Great caution must be taken in accepting the data obtained as representative of means and medians for the total sample population. There are two main reasons warranting caution.

a) When 50% of a sample population refuse to answer a certain question this by itself is a datum. It is interpreted to mean that the question is of a sensitive nature. If this be so, then the truth value of the answers given can not be taken for granted.

b) It is not known whether the 50% who did not answer the question, belong to a distinct category of the population where incomes are concerned. If they do, the presented data may be greatly skewed in one or the other direction, even if they are based on truthful answers. If, however, the 50% who refused to answer the question represent a distribution of incomes similar to the 50% who did answer, then the data obtained represent the mean and median incomes of the total sample population.

With the above reservations in mind, incomes will be discussed and analysed on the basis of data obtained in Misamfu and Kasama where 63% of interviewees answered the question.

Table 2.8. Incomes from business, agriculture etc.

	Number of households	N/A	Mean income	Median income	Have unspecified such income	Have no such income
Kasama	34	16	51	50		14
Misamfu	39	18	* 162	50	4	6
Mbala	12	1	*2040	60	1	5
Mporokoso	9	3	80	80		5
Luwingu	9	9				

* Mbala distribution: 1 household K 10.000 to 1 household K 20
* Misamfu distribution: 1 household K 1.000 to 1 household K 20

The number of households refusing to answer this question is about 50 percent. The number of households stating that they had no extra incomes is about 30 percent.

The caution not to take this information at face value must be repeated.

We do not know what proportions of the incomes from table 2.8. are from business and what proportions are from agricultural sales. We do, however, know that some are from the latter. Concerning these, we should bear in mind that the earnings from agriculture "last month", as termed in the questionnaire, does not necessarily represent average monthly incomes from agriculture. During the survey period October/ November, many farmers are paid for their yearly cash-crop of maize. Thus, the figures stated do not represent average monthly earnings, but a more or less once per year payment for one of the main cash crops. This again has consequences for another source of income for many households, namely the brewing and sale of local beer. This will be more frequent during periods of affluence, and one such is when people get paid for their crops. It is therefore reasonable to assume that to the degree that we can trust the figures stated under incomes from business and agriculture, these may be considerably higher during the survey period than during parts of the rest of the year.

Table 2.9. Distribution of incomes from employment. Number of households earning:

	K 0 - 50	K 51 K 100	K 101 K 200	K 201 K 300	K 301 K 400	K 401 K 800	Over K 800	N/A
Kasama		1	11	8	1	4		9
Misamfu	4	6	5	4		3		17
Mbala							1	11
Mporokoso	1					1		7
Luwingu		1	1		1			6
Total	5	8	17	12	2	8	1	50

Of the 63 households that answered the question we find that:
20% earn below K 101 per month
48% " " K 201 " "

This means that if the generally acknowledged maximum acceptable water rate of between 3 percent and 5 percent of cash incomes were applied, a rate of K 10 is affordable by about 50 percent of medium and high cost housing residents.

If we compare these findings to the survey in Katete and Mumbwa, we get:

Table 2.10.

	Katete and Mumbwa	Kasama Misamfu Mbala Mporokoso Luwingu
K 10 affordably by	93%	50%
K 15 " "	76%	20%
K 20 " "	50%	15%

If we take the median incomes from employment, business and agriculture per household per month, based on the above information from Kasama and Misamfu, it comes to K 195. Based on this median, the maximum flat rate that should be charged for the domestic consumer category should be K 10, and even this figure is affordable (within the 5 percent maximum limit) by only about 50 percent of the households in medium and high cost housing.

We have some information that partly explains the differences in households' incomes between the above survey areas. Whereas there was a factor of 1.5 percons with incomes in Katete and Mumbwa, the factor was 0.9 in the 2 towns in Northern Province. If we compare mean incomes from employment, we get:

Table 2.11.

	Mean
Katete	K 262
Mumbwa	K 559
Kasama	K 260
Misamfu	K 209

If we adjust the factor of permanent employment to 1.5 in Kasama and Misamfu, we should expect similar incomes to those in Katete and Mumbwa since most of the permanently employed people are civil servants on national salary scales. However, even when we neutralised the factor of employment we find significant differences in mean incomes between the four localities, with Katete at K 462, Kasama at K 410, Mumbwa at K 559 and Misamfu at K 334.

Some of the major factors influencing people's ability to pay will be:

a) The factor of employment in the household
b) The amounts and sources of income deriving from business, agriculture etc. Such information is notoriously difficult to get through the questionnaire method.
c) Other economic commitments such as education of children. The percentage of children educated and the level of education sought vary from region to region.

An alternative method which is believed to give a rough estimate of total economic ability has been tried in Western and Northern Provinces. Based on findings by the Household Budget Survey 1974/75, Preliminary Report, Central Statistical Office, Lusaka, February 1980, expenditures of households are assessed to be:

Food	53 percent
Alcohol and tobacco	6 percent
Clothing and footwear	13 percent
Housing and household equipment	14 percent
Miscellaneous	14 percent

The alternative method aims at finding how much various groups of the population use for food. The amounts of staple food, i.e. mealie-meal, is fairly constant in the populations. Informants are asked what they have had for relish the last week and what the costs were. This is a matter they are usually not unwilling to discuss, even if neighbours and spouses are present during the interview. Based on information about the last days' consumption, a household monthly budget is generated, and the results are as follows:

Table 2.12.

Kasama, high and medium standard housing in Newtown. (Sample: 12).

Relish per person per day, mean	K 0.68	
Relish per household/day, mean	K 4.68	
Relish per household/month, mean		K 140
Oil, sugar, coffee, tea etc.		K 5
Mealiemeal		K 24
53 percent of household expenditure		K 169
100 percent household expenditure		K 319

Assuming that most households do not save considerable amounts and do not overspend considerably, it is assumed that the average total income per household per month is K 319.

Kasama, traditional housing standard, Kapoka compound, (Sample: 12).

Relish per person per day, mean	K 0.28	
Relish per household per day, mean	K 1.68	
Relish per household/month, mean		K 50.40
Oil, sugar, coffee, tea etc.		K 2.50
Mealiemeal		K 24.00
53 percent of household expenditure		K 76.90
100 percent monthly household expenditure		K 145.00

Misamfu, high, medium, low housing standard. (Sample: 9).

Relish per person per day, mean	K 0.63	
Relish per household/day, mean	K 2.60	
Relish per household/month, mean		K 87.00
Oil, sugar, coffee, tea etc.		K 3.50
Mealiemeal		K 24.00
53 percent of household expenditure		K 114.50
100 percent monthly household expenditure		K 216.00

Mongu, traditional housing standard, Imwiko Compound. (Sample: 19).

See NIVA Report 9/81, Appendix A:	
100 percent expenditure per month was found to be	K 94.00
+ about 20 percent inflation since 1980	K 18.80
Assumed household expenditure 1982 prices	K 113.00

Based on the purchase of relish one can find the distribution of incomes and thereby the affordability of the various rates for water per month:

A rate of K 10 per month is usually judged affordable at a monthly income of minimum K 200.
K 200 divided by the average number of persons per household is K 28.60

53 percent of this amount for food	K 15.16
Less oil, mealimeal etc.	" 3.86
Relish/pers/month	K 11.30
Relish/pers/day, minimum	K 0.38

A rate of K 15 per month is usually judged affordable at a monthly income of minimum K 300. K 300 divided by the average number of persons per household is K 42.80.

53 percent of this amount for food	K 22.70
Less oil, mealimeal etc.	" 3.86
Relish/pers/month	K 18.84
Relish/pers/day, minimum	K 0.63

A rate of K 20 per month is usually judged affordable at a monthly income of minimum K 400. K 400 divided by the average number of persons per household is K 57.

53 percent of this amount for food	K 30.00
Less oil, mealimeal etc.	" 4.00
Relish/pers/month	K 26.00
Relish/pers/day, minimum	K 0.87

According to this method the ability to pay is:

K 10 in Newtown, Kasama	100 percent of the sample population
K 10 in Misamfu	66 percent " " " "
K 15 in Newtown	58 percent " " " "
K 15 in Misamfu	66 percent " " " "
K 20 in Newtown	17 percent " " " "
K 20 in Misamfu	44 percent " " " "

A comparison will be made to the Newtown sample of 12 households' answers to the questionnaire.

Table 2.13

Incomes from:	Employment	Business/ agric. etc.	Profession
1)	N/A (1 pers.)	nil	Senior Officer
2)	85 (1 pers.)	60	" "
3)	N/A (1 pers.)	nil	" "
4)	650 (2 pers.)	"	" "
5)	195 (1 pers.)	N/A	Junior Officer
6)	250 (1 pers.)	"	Senior Officer
7)	180 (1 pers.)	"	" "
8)	254 (1 pers.)	"	" "
9)	150 (1 pers.)	15	Driver
10)	190 (1 pers.)	N/A	Electrician
11)	245 (1 pers.)	"	Senior Officer
12)	205 (2 pers.)	"	" "

Table 2.14 Ability to pay in Newtown when comparing the two methods of estimating household incomes.

	"Relish" method	Direct question method
K 10 per month:	100 percent	50 percent
K 15 " "	58 percent	10 percent
K 20 " "	17 percent	10 percent

Weaknesses of the methods

Direct question about incomes:

a) A household's failure to understand the purpose of the household budget survey, or their active interest in conceiling amount of income in fear of a rise in water rates.

b) Suspicion that the enumerator was in fact a prospective thief (letters of introduction were not always thought genuine).

c) Fears by husbands that wives would discover how much they earned and/or how much they spent on beer, cigarettes etc.

d) Doubts whether the information on income would remain confidential.

e) If the above does not prevent an informant from answering, it may bias his answers.

f) Fluctuations from month to month in incomes generated from business, agriculture etc.

g) The often encountered difficulty of being able to separate a household from its neighbours during the interview, and the constraints this imposes on honest answers.

Assessing incomes on the basis of expenditures on food:

It is felt that points a), b), c), d), e) and g) above will not influence the answers to any significant degree.

h) Fluctuations from month to month in incomes generated from business, agriculture etc. will probably influence the amount of relish bought. The season of the year, determining easy access to collecting free relish like mushrooms, caterpillars, flying ants etc. will also influence the amount of relish that has to be bought.

i) The method is more time-consuming for the interviewer, both as to obtaining the data and as to calculating incomes from them.

j) The Household Budget Survey 1974-75 took place and was devised for semi-urban and rural households. In fact, Kasama was one of the localities classified as semi-urban by that Survey. The approach and method should therefore be valid and reliable for the towns in Northern and Luapula Provinces.

2.9 Use by Neighbours

Access to private taps by neighbours.

Households having their own connection were asked whether or not they allow other families to draw water from their connections. The results are summarized below.

Table 2.15.

	Taps are used by others	Taps are not used by others	Percentage of house-holds allowing use	N/A
Kasama	10	24	30	
Misamfu	17	22	44	
Mbala	5	7	42	
Mporokoso	5	4	55	
Luwingu	2	4	22	3
Total			39 percent	

Informants were also asked if many people used their taps, if they used them often and drew much water. Of the 39 percent allowing neighbours to draw water there are 8 cases (20 percent) where over 5 other households used their taps daily and drew much water. This implies that we have an extra 40 households (in addition to the sample of 100 households who answered the question) who depend on their water for consumption from our sample population. In addition there were 26 cases where water was drawn daily (unpecified amount) by others, and 20 cases where much water was collected (unspecified frequency).

The use of neighbours' taps will depend on housing patterns. Where households with private taps are situated close to informal housing compounds for instance, one should expect extended use of these taps. Even if there are communal standpipes in these compounds, some households will pay their neighbours for access to private taps in order to avoid queuing and a possibly longer walking distance.

2.10 Present Monthly Water Bills

Table 2.16.

	Less than K 4	K 4	K 5	K 5.10 - K 7.00	Nil	N/A
Kasama	6	23			1	4
Misamfu					39	
Mbala		1	2	2	1	6
Mporokoso		4	2		2	1
Luwingu			9			
Total	6	28	13	2	43	11

According to the answers in the sample, K 201, is collected monthly from 92 households (N/A = 11). The median bill is K 5, but the mean bill is K 2.20, mainly due to Misamfu households paying nothing. If we exclude Misamfu, the mean monthly bill is K 3.80 per household. However, if we include the 8 x 5 households who are permitted to draw much water daily from neighbours, we get a mean bill of K 2.16. If we include both these 40 households and Misamfu, we get a mean monthly bill of K 1.50.

2.11 Attitudes to Present Level of Water Rates

Informants were asked if they consider the present water rates high, normal or low.

Table 2.17

	High	Normal	Low	N/A
Kasama	3	31		
Misamfu		29	10	
Mbala	8	2	1	1
Mporokoso	3	4		2
Luwingu	5	2	2	

Including Misamfu, where households are not charged for high service water supply, we find that about 70 percent consider the rates to be normal or low. This is a surprisingly high rate of acceptance, when bearing in mind the almost 100 percent dissatisfaction with the supplied water as to colour, taste and reliability.

It seems that attitude in this connection is dictated mainly by conservatism as to the present rates. How else do we explain that over 90 percent in Kasama, who has a notoriously unreliable system, consider their rates normal? And that Misamfu, who, paying nothing for a good system and knowing about the water rates and intermittent service in Kasama, consider their rates normal? Some further discussion about this will take place under the next few tables.

2.12 Metering

Informants were first asked if they had meters, and whether or not they were working. Those who had working meters were asked what their monthly bills were.

Table 2.18.

	Number of households having meters	Working meters	Not working meters	Don't know	Paying K 4	K 5	Over K 5	N/A
Kasama	17	15	2		13			2
Misamfu								
Mbala	12	11	1			*3	3	4
Mporokoso	6	4		2	3			1
Luwingu	6	5	1			5		

*1 consumer pays an average K 80.
2 consumers pay an average K 300.
In all 3 cases they are, however, referring to the bills charged, by the statal or parastatal bodies for which they work (barracks and farm).

According to informants 85 percent of the meters seem to be working. However, since most private households in the sample are paying flat rates, there is no need for the consumers to know whether their meters actually work or not.

2.13 Preferred Water Rating Method

Consumers were asked whether they thought water rates should be based on the quantity of water used, or should be a fixed amount included in their taxes or as a flat monthly rate.

Table 2.19.

	Flat monthly rate	Included in tax	By amount used	Flat or taxed	N/A
Kasama	23	1		10	
Misamfu	12	24	2		1
Mbala	7	3	1		1
Mporokoso	7		2		
Luwingu	7		2		
Total	56	28	7	10	2

Over 50 percent of the sample has an absolute preference for a fixed rate. Not surprisingly, over 60 percent of Misamfu informants state to prefer water rates to be collected through taxation, since this is what they pretend to believe is being done today. (They do know that their taxes are the same as those paid in Kasama near by, and they do know that consumers in Kasama are billed for water.)

The conservative trend in answers to this kind of question is understandable. Due to recent years' economic and political difficulties faced by Zambia and other border states,the medium and upper salary brackets have experienced a relative deterioration in standard of living. The conservatism indicated by answers to various parts of the questionnaire is probably explained by the belief that any change is a change for the worse, where economy is concerned.

Table 2.20. Attitude to Water Meters.

	Meters are good	Meters are not good	Meters are good, but fixed rate to be paid	Meters are not good, but water should be paid by quantity used	N/A
Kasama	1	19	14		
Misamfu	6	25	4	1	3
Mbala	3	8	1		
Mporokoso	2	1	5		1
Luwingu	2		7		
Total	14	53	31	1	4

Over 30 percent were inconsistent in their answer to this question. Consistency is taken to mean that either i) water meters are good and water should be charged for on a quantity used basis, or ii) water meters are not good and water should be charged for on a fixed rate basis. Seen separately, the two last tables seem to indicate preferences, but when computed together there was almost 1/3rd of inconsistent answers. Some may have been arguing that while water meters are a good idea generally, the consumers prefer to be charged flat rates.

The fact that 64 percent at Misamfu said that meters are not a good idea, is very understandable, since the installation of meters implies that water will have to be paid for.

Table 2.21. The maximum monthly rate the consumers state to be willing to pay.

	Nil	K 2.00 to K 4.00	K 5.00	K 6.00 to K 10.00	Over K 10.00	N/A
Kasama	8	20		1		5
Misamfu	25	4	1	2		7
Mbala		5	6		1	
Mporokoso		3	3	3		
Luwingu			5	3	1	
Total	33	32	15	9	2	12
	32%	31%	15%	9%	2%	11%

2.14 Willingness to Pay

There is a high correlation between what consumers are presently paying and what they are willing to pay. The only exception is Luwingu where over 40 percent state they are willing to pay more than they presently do. Although the sample is small, this information is believed to be valid and reliable, since the findings were confirmed through informal conversations during the survey. Luwingu has one of the best

water supply systems visited by the consultant. However, due to inefficiency and a bad rate of billing and collection by the Council, the pumping hours are restricted and water is rationed to supply the various sections of town for only some hours per day each. Thus, in Luwingu, the possibility of having a safe and reliable water supply is not hypothetical, but a reality, if adequate rates are collected. The consumers know this to be so.

The situation is different in Kasama, for instance. Here consumers know that even if they pay, there will be frequent break-downs on the mains and reticulation. The question is obviously understood by consumers to mean what maximum rate they are willing to pay for their present supply system. There is again the expected influence of rates paid presently on maximum rates they are willing to pay in future.

Ideally the survey would have attempted to determine (i) the maximum monthly flat water rate that consumers were prepared to pay and (ii) their maximum willingness to pay for water charged for on a quantity used basis, i.e. the maximum basic charge and maximum rate per cubic metre that they were prepared to pay.

However, in setting up the survey it was obvious that a number of difficulties existed. Hence the willingness to pay questions relates to the maximum amount that an interviewee would be willing to pay monthly for water. The actual questions relate to the maximum monthly flat rate that the consumer would be willing to pay, but it is thought that some interviewers did not always stress the flat rate concept and simply asked a consumer what would be the most that he would be prepared to pay monthly for water, without mentioning the pricing method.

2.15 Willingness to Pay More for a Better Service

Consumers were asked if they would be willing to pay more for a better service, usually interpreted as a continuous and/or treated supply.

Table 2.22.

	Willing to pay more	Not willing to pay more	Much more	A little more
Kasama	34		24	10
Misamfu	34	5	16	12
Mbala	12			1
Mporokoso	9		5	1
Luwingu	9		8	1

Almost 100 percent were willing to pay an unspecified more for a better standard service, and over 50 percent were willing to spend much more. The reason for not being willing to pay, stated by 5 percent of the sample, was that they were poor. These 5 percent are made up of consumers who at the present time are paying nothing.

At Misamfu, the supply is fairly reliable, but the water is not chlorinated. Most consumers were very concerned that the water goes by gravity from the filters into the reticulation, and they expressed the need for a treatment tank, and stated to be willing to pay.

2.16 Alternative Approach to Consumers' Willingness to Pay

The maximum monthly rate consumers state to be willing to pay, estimated by a cut-off point approach.

After an informant had stated his maximum willingness to pay for water, the enumerator asked: if the rates were to be fixed at a figure which exceeded his originally stated figure by 2-3 kwacha, would he then i) pay, or ii) refuse to pay and be disconnected. If the informant said he would pay, the question was asked again with the rate further increased. This process was repeated until the informant said he would no longer be willing to pay. The results are presented below.

Table 2.23.

	Will pay nothing	Less than K 4	K 5	K 6	K 11	K 21	Over	N/A
Kasama	8	5	3	3	7	5	1	2
Misamfu	27	1			4		2	5
Mbala	1				9		2	
Mporokoso			1	5	1		2	
Luwingu				7	2			
Total	36	6	4	15	23	5	7	7
	35%	6%	4%	14%	22%	5%	7%	7%

Still bearing in mind that the present supply system and a possible conservatism in connection with present water rates influences the answers, there is an increase in expressed willingness to pay. Whereas in Table (2.21) 63 percent would pay K 4 or less, now only 41 percent fall in this category. To the latter question, 34 percent would pay K 11 or more per month if threatened by disconnection, while to the former question only 2 percent state a willingness to pay such an amount.

An expressed willingness to pay over K 21 by 12 percent of the sample, and to pay over K 50 by 7 percent of the sample, deserves some comments. In the consultant's view it is not unlikely that some consumers would see this as an economic strategy. Once the rates get really high, most of their neighbours would not be willing or able to pay. They would be disconnected. The consumers with remaining connections would then see a definite possibility of charging a number of neighbours a monthly rate for access to their private taps. Since billing for quantity used is rare, they would hardly be worse off, and possibly better off, than they are with the present rates. This strategy is not unheard of even at the present water rates. Obviously, there are some consumers who do have large incomes and who would be willing to pay large amounts for a good supply of safe water, - just as there are informants who may want to impress the interviewer or other listeners.

The willingness to pay stated through the cut-off approach is:

Table 2.24.

	Mean	Median
Kasama	K 13.00	K 17.00
Misamfu	" 7.50	0
Mbala *	" 14.00	" 15.00
Mporokoso	" 29.00	" 10.00
Luwingu	" 10.00	" 10.00

* Disregarding 1 informant answering K 900 per month and another informant answering K 200, since it is known that they are speaking about the institutions for which they work.

2.17 Determination of Appropriate Monthly Charges based on the Survey Data.

Table 2.25 Willingness to pay.

	Assessed by cut off approach for a better supply	Assessed by direct question for the present supply
	Median	Median
Kasama	K 17	K 2 to 4
Misamfu	K 0	K 0
Mbala	K 15	K 5
Mporokoso	K 10	K 5
Luwingu	K 10	K 5
Katete	K 18	K 6
Mumbwa	K 18	K 5

The willingness to pay, assessed by direct question to the consumers and concerning the maximum rate they are willing to pay for the present supply, corresponds largely to what they are presently paying or are supposed to pay. This may be interpreted in two ways:

i) It shows a conservative attitude to change, or a fear that a change would be a change to the worse. This seems the appropriate interpretation since there are differences between the various regions and since these differences correspond to present tariffs paid.

ii) The amounts stated reflect the maximum amount consumers are willing to pay for the present level of service.

The two interpretations do not mutually exclude each other.

The willingness to pay, assessed by the cut-off approach and understood by consumers to mean the maximum amount they would pay monthly for an improved supply, shows a general willingness to pay which may surpass this survey's calculated estimates on their ability to pay. (Misamfu is an exception, but the data should be understood in the context of their being used to a reliable water supply system free of charge.)

Possible interpretation of the willingness to pay for an improved service:

i) If there is a fairly constant correlation between ability and willingness to pay, then household incomes in Northern Province may be higher than the data obtained indicate.

ii) An adequate water supply may be such a priority that consumers are willing to cut down on other expenditures.

iii) Consumers' statements as to willingness to pay may be exaggerated. There is presently an often low performance in the collection of water fees, and many towns infrequently disconnect defaulters. Consumers may hope to get an improved supply by stating a willingness to pay, but they may, based on the above experience, calculate on not having to pay for it.

According to survey data there are fairly large differences between household incomes in the different Provinces. There are also great

differences in information obtained through the different approaches. Misamfu is the control sample where both methods were used, and the ability to pay, based on the principle that water rates should not exceed 5% of income, varies greatly with the approaches tried. The direct question method about incomes was the only one used in Katete and Mumbwa. The direct question method was used in conjunction with the "relish" method in parts of Northern Province. The "relish" method was the only one used in Western Province, and the calculated incomes showed a co-variation with other factors established in that survey, factors believed to indicate economic ability, such as ownership of shoes and number of students in a population at secondary boarding schools.

Incomes and household budgets are notoriously difficult to assess, and reference is made to the discussion of weaknesses and strengths of the two methods used in Zambia, under Table 2.4.

Table 2.26 Ability to pay the varying rates in percentage of population.

	Assessed by direct questions about incomes from permanent employment		Assessed by "relish" method indication total incomes	
	Katete, Mumbwa	Kasama Misamfu Mbala Mporokoso Luwingu	Newtown (Kasama)	Misamfu
K 10	93	50	100	66
K 15	76	20	58	66
K 20	50	15	17	44

Alternative interpretations of the survey data:

i) The data are accepted and there are differences in household incomes from permanent employment between the provinces, even when the factor of employment is neutralized.

ii) The data from some or all regions are skewed or not valid.

If the data are accepted, the discussion of National Water Pricing Policies will have to consider:

a) Should there be different water pricing policy structures for the different Provinces, based on surveys trying to establish incomes from employment? If so, similar studies are clearly warranted in the Provinces not covered, or not adequately covered by the present surveys.

b) If one national tariff system be applied, will the rates be low enough to make water affordable by the population presently served by a piped water supply, within the maximum 5% of income rate?

c) If one national tariff system be applied, will the rates be high enough to cover economic or financial costs for the piped supplies?

d) If one national tariff system be applied, will the rates be high enough to cover financial costs of piped supplies plus to subsidize or pay for rural water supplies?

It might seem administratively desirable to have one national tariff system, and it might seem financially desirable to have varying tariff systems. A decision as to which strategy to chose will and should, however, be influenced by national objectives of a political character.

Whichever of the above strategies is chosen, will the rates be calculated on the basis of:

e) Quantity of water used? In this case a major programme of repair and installation of meters is involved. A training programme for personnel in calculation and book-keeping methods is also necessary.

f) Flat monthly rates? In this case, will the rates be based on official salaries as paid by the different central Ministries and parastatal institutions and from the decentralised provincial departments? Or will they be based on housing category standards high, medium and low, assuming there is a high correlation between incomes and housing standard?

There is no one-to-one relationship between an improved water supply and better health. The availability of a certain quality and quantity of water is a necessary factor for better health, but it is not a sufficient factor. Certain levels of nutritional and educational standards are also necessary factors for an improvement in health. Given that drastically increased water rates could be collected, this might imply better functioning of water supplies, but it might also imply a deterioration in the over-all health standard.

National governments and heads of households must balance investment of economic resources between these and other factors relevant for an improvement in health and quality of life.

The consultant for the Mumbwa and Katete survey demonstrates the procedure for calculating water rates when weight is given to the financial criterion. If his suggested rate of K 14 be collected from the high and medium cost houses, this would imply a doubling of revenue collected, therefore a better functioning water supply system and an increase in health benefits for the high-income part of the population. It would also imply that a high standard of service were available if and when the rest of the population attained levels of income that made piped water affordable for them. The rate of K 14 would lead to a deterioration in health for 35% of the population in Katete and 14% of the population in Mumbwa. The rate of K 14 would, according to the direct question about incomes, lead to a deterioration in health for 80% of the population in the Northern Province towns. This argument is based on the options of the lower-income sectors of the population:

i) To be disconnected from their present piped water supply.

ii) To pay more than 5% of incomes in water fees, which, according to the United Nations principle, is not advisable because it might mean a significant reduction of economic investment in other factors equally important for improvement in health.

The Water Pricing Policy studies are believed to clarify the issues to be discussed and balanced by the Government of Zambia. Obviously, there is a conflict between the International Drinking Water Decade objective of providing better health for all on the one hand, and what is financially feasible for the country on the other hand.

3. LOW SERVICE SURVEY

3.1. Family Size

The number of persons in the sample households was investigated and the results are presented in Table 3.1.

Table 3.1. Size and composition of Low Service consumer households.

	Number of households	Total children	Total adults	Total persons	Average children per household	Average adults per household
Kasama N.P.*	33	115	93	208	3.5	2.8
Mbala "	36	190	130	320	5.3	3.6
Mporokoso"	9	38	23	61	4.2	2.6
Nseluka "	12	50	33	83	4.2	2.7
Kawambwa L.P.*	7	13	11	24	1.9	1.8
Nchelenge " & Kashikishi	12	45	28	73	3.8	2.3

* N.P.= Northern Province
L.P.= Luapula Province

Table 3.2. Average size and composition of Low Service consumer households.

	Average number of persons	Percentage of children
Kasama	6.3	55
Mbala	8.9	59
Mporokoso	6.8	62
Nseluka	6.9	60
Kawambwa	3.4	54
Nchelenge & Kashikishi	6.1	62
Total average	7.0	59

We find, as expected, that the High Service Group has larger households (7.8 average) than the Low Service Group with an average of 7 persons.

There are great variations in household sizes, the total average being 7 persons. Kawambwa has an average of only 3.4 persons per household, and the consultant can forward no explanation for this, except that the sample is small and therefore may not be representative. The household size in Mbala is significantly higher than in other towns and the same was found in the High Service consumer Category where the size was 12.3 as compared to the Low Service Group's 8.9.

3.2. Housing Category.

Table 3.3.

	Traditional	Low	Medium
Kasama	29	4	
Mbala		26	10
Mporokoso	2	5	2
Nseluka	1	11	
Kawambwa	6		1
Nchelenge & Kashikishi	6	6	
Total	44	52	13
Percentage	40%	48%	12%

In designing new or improved water supplies, different consumption criteria are used for the different housing categories. It is furthermore assumed that ability and willingness to pay for water will vary according to housing categories. Therefore the housing category of the interviewees were recorded.

3.3. Existing Source Used by Low Service Consumers.

Table 3.4.

	Public standpost	Traditional source
Kasama		33
Mbala	25	11
Mporokoso	8	1
Nseluka		12
Kawambwa	4	3
Nchelenge & Kashikishi	12	
Total	49	60
Percentage	45%	55%

In the sample, 84% of the households in Luapula Province are public standpoint users, whereas these make up only 58% in the sample from Northern Province.

3.4. Water Carriers.

Interviewees were asked which people in the household regularly carry water home. The summarized results are shown in Table 3.5.

Table 3.5.

	Wife	Wife and children	Children	Others
Kasama	18	12	3	
Mbala	5	28		3 Husband helps
Mporokoso	7	2		
Nseluka	4	5		3 Husband helps
Kawambwa	4	3		
Nchelenge & Kashikishi	5	7		
Total	43	57	3	6

In only 5% of the cases do people other than wives and children bring water to the house.

In 40% of the households the wife is the only carrier of water. This may have to do with the stage reached in the development cycle of the family (there are only children too small for such tasks) or it may have to do with tendencies noted in other reports, i.e. that as access to water improves, this chore becomes the responsibility of the wife/mother alone.

3.5. Distance to Waterpoint and Time Used.

Low Service comsumers were asked about the distance to the waterpoint and the time used per pay to collect water. The findings are presented in the next two tables.

Table 3.6. Approximate distance to waterpoint in meters:

	0-50m	51-200m	201-500m	501-1000	1001-1500	Over 1500m
Kasama	4	1	7	10	7	4
Mbala	14	4	10	6	2	
Mporokoso	2	5	2			
Nseluka	1	2	3	4	2	
Kawambwa	2		3	1	1	1
Nchelenge & Kashikishi	7	3	2			
Total	30	15	27	21	12	5

Table 3.7. Time used per day for collecting water, in minutes:

	0-10	11-20	21-30	31-60	61-120	Over 120	N/A
Kasama	14	8	6	3			2
Mbala	28	3		5			
Mporokoso	4	3	2				
Nseluka	1		4		3	2	2
Kawambwa	2	1	1	3			
Nchelenge & Kashikishi	7		3	2			

The degree of consistency in answers to the above two questions was low. In almost 50% of the cases there was not a good correlation between the distance given to the source of water, the number of trips and the time used. This may be due to a variety of reasons:

In households where many people are responsible for collecting water, nobody may be aware of how many trips are taken per day, although information on this point is believed to be fairly accurate. Informants are, however, not in the habit of assessing time used in hours and minutes, and this information correlated badly with the distance given. Where the time used greatly exceeded what one would expect in relation to the distance given, one might assume that time was spent in queuing. In the many cases where time used was impossibly low compared to the distance stated, one does not know which of the two statements are correct, if any.

These discrepancies were not apparent till after the field-work period. Due to the large area to be covered within limited time the consultant could not follow up the work done by the assistants after the initial training. Analysing of data could not take place till later, when the consultant had left the region.

3.6. Consumption by Low Service Consumers.

Table 3.8. The estimated mean volume

Kasama	11 l/c/d
Mbala	16 l/c/d
Mporokoso	20 l/c/d
Nseluka	11 l/c/d
Kawambwa	21 l/c/d
Nchelenge & Kashikishi	22 l/c/d
Total mean	16.8 l/c/d

Not only are the number of trips, time used and distance to water source difficult to assess through direct questions to informers, for the reasons stated above. The size of the vessels used for collection is also estimates given by the informants. As was seen

from Table 3.5, children were involved in the collection of water in 60% of the households. Although the informant, being and adult, might quite correctly have stated that the vessel usually employed for collecting water was a 20 litre bucket and that the average number of trips for the household is 5 per day, this might not mean a consumption of 100 litres. If children perform 3 of these trips, the amount of water carried by them will be influenced by age and health. Therefore, the above data should be regarded as estimates.

There is, however, a correlation between the litres used per person per day and accessibility of water. If we look at the three highest consumption data per person/day, i.e. Mporokoso, Kawambwa and Nchelenge/Kashikishi, we find that the median distances given are 50-200m, 200-500m and 0-50m, respectively, whereas the two lowest consumption data, Kasama and Nseluka, have median distances of 500-1000m and about 500m, respectively. Mbala has a consumption between the two categories, and a median distance of about 200m. Distance is, however, only one of the factors determining accessibility. Mbala has sections that are seriously affected by irregularity of supply and therefore queuing, and this may explain the low l/c/d in spite of a fairly short distance to the water source.

The similarity of per capita use of the public standpipe and township traditional source consumers is consistent with experiences in a wide range of African countries, that as soon as consumers have to carry water, they are unlikely to consume much more than 15 litres per capita per day.

Most consumers do not use much water at the standpipe. It is therefore suggested that as long as township residents continue to use public standpipes, their per capita use may remain as low as 15 litres per day, (excluding wastage at the tap). Hence designs based on a consumption criterion of 30 or even 40 litres per day are possibly misguided unless they include a high level of wastage. Furthermore individual connections should, by increasing the water consumption of low use consumers, significantly increase the benefits of a supply. They should therefore be encouraged wherever consumers have the ability to pay for them.

3.7. Purposes for which Water is Used at the Source and at Home

Informants were asked for what purposes they use the water. Apart from drinking, cooking and personal hygiene, which almost invariably takes place at home, there are some variations between the districts.

Table 3.9.

	Watering garden	Brick-making	Washing of clothes and utensils at home	Washing of clothes and utensils at water point
Kasama	25%	24%	6%	94%
Mbala	25%		100%	
Mporokoso	67%		78%	22%
Nseluka	25%	75%	50%	50%
Kawambwa	0	0	71%	29%
Nchelenge & Kashikishi	0	0	50%	50%

Rather unsurprisingly all interviewees carry water home for drinking, cooking and bathing, although as seen above a number of rural families does a considerable part of their washing of clothes and utensils at the source.

The above figures should have some bearing on the estimated consumption of litres per person per day. As we see, washing of clothes and utensils takes place at home i Mbala, wereas it is almost invariably done by the water source in Kasama, and this affects the per capita consumption, as a relative increase in Kasama and a relative decrease in Mbala, as referred to the figures in Table 3.8.

Where brick-making is concerned, it is not reasonable to assume that this affects the consumption patterns, as the social organisation round such tasks, at specific times of the year, is different from the daily organisation for collecting water. Animal watering does not represent a major use of water.

The major non domestic use for which water is taken home is for gardening. There is no data on how much water was used for this

purpose. However, only families living close to their source/standpipe will take water home for gardening.

3.8. Attitudes to Work Involved in Collecting Water.

Table 3.10

Number of families stating:	Work is too much	Work is acceptable	Work is little	N/A
Kasama	11	21		1
Mbala	1		9	26
Mporokoso				9
Nseluka	9		1	2
Kawambwa	5			2
Nchelenge & Kashikishi	8	1		3
Total	34	22	10	43

Out of the 66 households answering the question, slightly over 50% feel that the work involved is too much. When comparing the answers given by public standpipe users versus users of traditional sources, we find that in the latter case 33% find the work involved too much, whereas 65% of the standpipe users find the work too much. This is a surprising result, and the findings in Northern and Luapula Province contrast with the findings in Katete and Mumbwa, except in the statement that the people who claimed that the work load was too much were not always those with the heaviest daily work-load.

The report from Katete and Mumbwa draws the same conclusions, stating that complaints from township residents (public standpipe users) seem to arise from higher expectations and comparisons with people having their own connections.

3.9. Use of Time Saved by a Closer Supply.

Interviewees were asked what they would do with the time they would save if a standpipe/other source was provided closer to their home. It is felt that the answers have a limited value. The fact that no one said they would spend more time in leisure activities, for

example beer drinking, suggests that people were constrained in their answers. In the rural sample answers were evenly divided between agriculture and household activities. Examination of the more articulate responses suggests that during much of the year the benefit of the time saved would be rather limited if related to production, but that it would be valuable to people engaged in agriculture during periods of peak labour demand.

3.10. Consumers' Attitude to their Traditional Sources.

Consumers were asked whether or not they were happy with their existing traditional source supply. The answers are summarised in Table 3.11.

Table 3.11. Attitude to existing traditional source.

	Sample	Negative	Positive	N/A
Kasama	(33)	32		1
Mbala	(11)	10		1
Mporokoso	(1)		1	
Nseluka	(12)	11	1	
Kawambwa	(3)	2	1	
Nchelenge & Kashikishi	(0)			
Total	(60)	55	3	2

92% stated a dissatisfaction with their present supply, and most said they would be extremely happy if the township supply was extended to close by their homes.

3.11. Complaints

Interviewees were asked directly what complaints they have with their existing water supply. The results are summarised in Table 3.12.

Table 3.12 Consumers' complaints of their existing supply

	Colour and taste	Too far	Too little	Queuing	Contaminated	No complaint
Kasama	31	12	22	1		2
Mbala	28	15	12	2		5
Mporokoso	1			1		7
Nseluka	11		12	8	11	
Kawambwa	5	1	1	4	1	
Nchelenge & Kashikishi	5	1		9	3	1

The total number of complaints exceeds the sample number, since many households had several complaints to make.

It is interesting to note that in the High Service consumer group 3% of the sample had no complaints about the water supply, whereas the Low Service group showed that 14% had no complaints.

We see that in Kasama, Mbala and Nseluka, who had the lowest per capita per day consumption, the complaints about water being too far away and too little has a factor of 0.9.

Informants are worried about the quality of the water. In Nseluka 100% fear that water is contaminated and poses a threat to health. In Kashikishi and Nchelenge, however, where one would expect a high degree of complaints on this factor due to frequent outbreaks of cholera, believed to be watertransmitted, only 30% complain about contamination. Factors connected with quantity of water available (distance, low pressure or yield, irregularity of supply and queuing) account for a factor of complaints of slightly over 0.9 and complaints about quality of water show a factor of slightly below 0.9 in the total sample of Low Service consumers.

3.12. Alternative Source for Existing Communal Standpipe Consumers

Interviewees were asked what would their alternative water source be if they were denied access to standpipes. The summarised results are shown in Table 3.13.

Table 3.13. Alternative source for consumers presently using communal standpipes.

	Number of households	River	Waterfurrow	Lake	No alternative
Kasama	0				
Mbala	25	19	2		4
Mporokoso	8	8			
Nseluka	0				
Kawambwa	4	4			
Nchelenge & Kashikishi	12			12	

The major feature of the table is that only 8% of cummunal standpipe users state that they have no alternative source if they could not obtain water from their standpipe.

3.13. Employment.

The number of households with a regular source of income from employment was investigated and the results are summarised in Table 3.18.

Table 3.14. Numbers of Low Service households having employed members, in permanent or occasional jobs.

Employment	No job	1 p. perm	1 p. occ.	2 p. perm.	1 p. perm. 1 p. occ.	2 p. occ.	N/A	Factor of permanent employment
Kasama	16	10	5	2				
Mbala	5	19	3	4		5		
Mporokoso	4	4					1	
Nseluka	8	1		1	2			
Kawambwa		1	4				2	
Nchelenge & Kashikishi		6	5	1				
Total	33	41	17	8	2	5	3	0.55

The factor of permanent employment is 0.55, i.e. about half that of the High Service consumers'. This will affect the Low Service consumers' ability to pay monthly rates.

The major features are:

i) In Kasama 48% of the households have no member with occasional or permanent employment. The factor of permanent employment is 0.42.

ii) In Mbala 14% of the households have no member with occasional or permanent employment. The factor of permanent employment is 0.75.

iii) In Mporokoso 44% of households have no employed members, and the factor of permanent employment is 0.44.

iv) In Nseluka 67% of households have no employed members, the factor of permanent employment being 0.33.

v) In Kawambwa all households have one member at least occasionally employed, but the factor of permanent employment is 0.20.

vi) Nchelenge and Kashikishi represent the highest factor of permanent employment, 0.67, and all households have a member with at least occasional employment.

vii) 30% of total sample of Low Service households do not have any member in occasional or permanent employment, and over half of the households have no permanently employed member. Payment of monthly water rates could present a major problem to a population largely dependent on cash from seasonal agricultural production and temporary employment.

3.14. Incomes

Income data were collected from low service consumers, but as has been mentioned earlier this type of data collected during a single

interview survey has a limited reliability. The summarised results of Low Service consumers' responses are presented in Table 3.15.

Table 3.15 Incomes from employment, Low Service consumer group

	Number of of households	N/A or nil	Mean income	Median income
Kasama	33	27	K 150	K 100
Mbala	36	35		
Mporokoso	9	9		
Nseluka	12	6	K 241	K 240
Kawambwa	7	7		
Nchelenge & Kashikishi	12	8	K 140	K 150

The enumerators seem to have mixed their N/A (no answer) and nil (nil answer, or nil income). The informants were very reluctant to divulge their incomes from employment, and the above table is based on a total of 17 consumers answering the question, out of a sample of 51 households stating that they had at least one member in permanent employment. The value of the information is therefore very limited.

The same population was then asked about their monthly incomes from agriculture, business etc. The summarised results are presented in Table 3.16.

Table 3.16. Incomes from agriculture, business etc., Low Service consumer group.

	Member of households	N/A or nil	Mean income	Median income
Kasama	33	8	K 98	K 85
Mbala	36	30	K 35	K 40
Mporokoso	9	8		
Nseluka	12	3	K 142	K 80
Kawambwa	7	6		
Nchelenge & Kashikishi	12	7	K 188	K 150

The enumerators seemed again to have mixed their N/A and nil answers. Although informants were very reluctant to devulge incomes from agriculture, business etc., they were less reluctant on this information than on information about incomes from employment. The above table is based on information on incomes from business and agriculture from 47 households out of 109.

A major limitation relates to income from agriculture due to its seasonal nature. Interviewees claimed agricultural income figures for the previous month and seasonal variations must be taken into account. The rural income figures should be treated with extreme caution.

Table 3.17. Incomes from other sources than employment, business, agriculture etc.

	Yes	No	N/A
Kasama	7	12	4
Mbala	21	14	1
Mporokoso	2	6	1
Nseluka	5	2	5
Kawambwa	1	2	4
Nchelenge & Kashikishi	2	6	4
Total	38	42	19

A total of 36 households state to have unspecified incomes from other sources than the above, 40 households state to have no such incomes and 19 refuse to answer the question.

Table 3.18. Overall incomes from employment, business and agriculture in the Low Service consumer group, based on the limited number of households willing to answer the questions (see above).

	K 0 to 50	K 51 100	K 101 to 200	K 201 to 400	Over K 400
Kasama	7	13	6	5	
Mbala	5	1	1		
Mporokoso		1			
Nseluka	4	1	4	6	
Kawambwa	1				
Nchelenge & Kashikishi	1	2	4	2	
Total	18	18	15	13	

17 of the answers pertain to incomes from employment (27% of the total number of answers to the question) and 46 of the answers pertain to incomes from business and agriculture (73%).

Out of the 17 households who answered the question about income from employment, 70% earned less than K 200 per month, and none earned over K 400. Out of the 46 households who answered the question about income from agriculture and business, 83% earned less than K 200.

Based on the overall incomes presented in Table 3.18 we see the median income is between K 51 and K 100 (in Katete and Mumbwa the median is between K 100 and K 129.)

57% of the sample have incomes downwards of K 100 (in Katete and Mumbwa the percentage is 36). 20% of households have incomes above K 200, the same as was found in Katete and Mumbwa. No household in this sample from Northern and Luapula Provinces makes over K 400 per month.

This means that if the generally acknowledged maximum acceptable water rate of between 3% and 5% of cash incomes were applied, a rate of K 10 is affordable by about 20% of the households. This rate was found to be affordable by 50% of the high service consumer group in Northern Province.

As mentioned earlier, the factor of employment is an important variable in this connection. This factor was about 1 for the high service group, and is 0.55 for the low service group.

The alternative method, based on relish purchased per person per month, and described above, (see Table 2.11) has been used to try to check information on incomes in Kapoka Compound, Kasama, for Low Service consumers.

Table 3.19. "Relish" method for estimation of total income per month.

Kasama, traditional housing standard, Kapoka compound		
Relish per person per day, mean	K 0.28	
Relish per household per day, mean	K 1.68	
Relish per household/month, mean		K 50.40
Oil, sugar, coffee, tea etc.		K 2.50
Mealiemeal		K 24.00
53 percent of household expenditure		K 76.90
100 percent monthly household expenditure		K 145.00

It was found that the mean income was K 145 per month from employment, business, agriculture etc., and the calculations were based on a sample of 12. According to this method, 25% of the sample in Kapoka, Kasama, can afford a K 10 rate.

If we calculate the affordability of a lower rate from the two methods, we find that the direct question about incomes from employment tells us that 50% can afford a rate of between K 2.50 and K 5. Using the "relish" method, we find that 83% of the households can afford K 5. Checking this against table 3.33 showing the answers to whether informants were willing to pay K 5 to K 8 for their own tap, 79% of the Kapoka group answered yes (many informants asked the enumerators to leave the K 5 and cross out the K 8).

3.15. Low Service Consumers' Preferences for Level of Service.

Interviewees were asked, if their only source be a well, would they prefer that it was equipped with a handpump or with a windlass and bucket. The results are presented in Table 3.20 from which it can be seen that an overwhelming preference was expressed for a handpump.

Table 3.20. Low technology preferences.

	Windlass	Handpump	Either	None	N/A
Kasama		16	4	3	10
Mbala			8	25	3
Mporokoso			2	7	
Nseluka		5	5	2	
Kawambwa			7		
Nchelenge & Kashikishi		6		6	
Total	0	27	26	43	13

Of the ones who mentioned handpump or either handpump or windlass, all informants stated that these technologies provided a constant supply, and that, in the case of a handpump, it was quick and easy to use. 8 informants in Mbala said they would only accept the windlass or handpump as a solution if these were closer to the village than the present supply from standpipes.

Contrary to what was found in Katete and Mumbwa, the populations in Northern and Luapula provinces do not seem to prefer a free well equipped with handpump to a public standpipe for which monthly rates will have to be charged.

70% prefer a standpipe, and we see that according to the last question 45% reject windlass or handpump as a possible solution.

The rural consumers' supply preferences thus also seem to conflict with the findings in Katete and Mumbwa. In Northern Province they would be:

1. Communal standpipe access at a charge of K 2 per month
2. Private connection or tap at a monthly charge of K 5
3. Wells fitted with handpumps, free of charge.

3.16. Willingness to Pay for Handpumps.

The informants were asked if they thought the local community would be able to solve the problem if the handpump broke down. The answers were distributed as shown below (Table 3.21).

Table 3.21. Community responses to handpump breakdowns.

	Will pay for repair	Will not pay for repair	Will pay monthly fees	Will call a meeting	Use old source	N/A
Kasama	18	1		7		7
Mbala		5				31
Mporokoso	3	2				4
Nseluka	2		3		2	5
Kawambwa						7
Nchelenge & Kashikishi	4	1				7
Total	27	9	3	7	2	61

The large percentage of people who did not answer this question were mainly the ones refusing the windlass or handpump as an alternative water supply. 19% refused to pay anything at all for repairs, 15% suggested that they would call a meeting in case of breakdown, assuming that the meeting would then decide if people should pay, how much, or how to repair. The 56% who say they are willing to pay for repair do not suggest how the organisation round the task is to take place.

3.17. Present Water Rates.

Most interviewees said that they are not supposed to pay and in fact do not pay for water. Nevertheless a few respondents claim to be paying varying amounts. This may be due to the fact that the questionnaire does not bring out the fact that they are being charged by a neighbour for using his tap. In one or two cases the answer may be just idle talk. It is interesting that non-collection by some councils has resulted in many people believing that they are not supposed to pay for water 'because they are using communal facilities'. Of

course in practical terms their veiw is correct, but it is contrary to government policy. A few people said they didn't know why they don't pay rates.

Table 3.22. Rate payment by Low Service households.

	Number of house-holds using standpipes	Are supposed to pay and claim to do so	Believe they are not supposed to pay and don't
Kasama	0		
Mbala	25	9	16
Mporokoso	8	8	
Nseluka	0		
Kawambwa	4		4
Nchelenge + Kashikishi	12	11	1
Total	49	28	21

As can be seen there is a total of 49 households in the Low Service consumer group who use communal standpipes. 57% of those using public standpipes say that they are supposed to pay. Most of those not paying, say that government gives this service free. 2 informants admit to having arrears of K 75, 4 say that they have never been charged and 4 refuse to pay because the service is unreliable. Only these latter 4 informers, and the 2 informers who admit to having large arrears, say they are not paying in spite of the fact that they know they are supposed to.

3.18. Willingness to Pay for Continued Standpipe Access.

Existing communal standpipe users were asked what would be the maximum monthly water rate they would be willing to pay for continued standpipe access. The responses of interviewees are summarised in Table 3.23.

Table 3.23. The maximum amount public standpoint users are willing to pay for continued access.

	Sample	Nil	K 1 or under	K 2	K 3	K 4	Over K 4	N/A
Kasama	(0)							
Mbala	(25)	15		1		7		2
Mporokoso	(8)		1		3	2	2	
Nseluka	(0)							
Kawambwa	(4)		4					
Nchelenge + Kashikishi	(12)		9	2	1			
Total	(49)	15	14	3	4	9	2	2

15 consumers in Mbala answer that they will pay nothing. The mean is K 1.66 and the median is K 1.00.

If we disregard the 15 consumers who are unwilling to pay, we get a mean of K 2.68 and a median of K 2.00.

One should bear in mind, though, that the stated willingness to pay does not only reflect economic willingness, but the consumers' willingness to pay for the present, and often unreliable, system of supply. This assumption is corroborated by the answers to the next question asked.

3.19. Traditional Source Consumers' Willingness to Pay for Public Standpipe Access.

Consumers using traditional sources at present were asked how much they would be willing to pay for access to a public standpipe close to their home. The results are summarised in Table 3.24.

Table 3.24. Traditional source consumers' willingness to pay for public standpipe access.

	Sample	Nil	K 0.10 to K 1	K 1.10 to K 2	K 2.10 to K 4	Over K 4	N/A
Kasama	(33)	7	7	8	4	1	6
Mbala	(11)	1	3		3		4
Mporokoso	(1)		1				
Nseluka	(12)	2	4	3		1	2
Kawambwa	(3)		3				
Total	(60)	10	18	11	7	2	12

10 interviewees will not pay anything. The mean is about K 1.20 and the median is between K 0.10 and K 1.00, which is not far below what the communal standpipe users state to be willing to pay for continued access.

It is the assumption that consumers state a willingness to pay as low a rate as possible, since the answers to the next question, shown in the table below, show a willingness to pay at least K 5 per month by a majority of the consumers.

3.20. Low Service Consumers' Basic Supply Preferences.

Low Service interviewees were asked whether they would prefer to use a reliably functioning standpipe close to their home for which they would have to pay K 2-3 per month or a free shallow well equipped with a handpump. The results are summarised in Table 3.25.

Table 3.25. Low service consumers' supply preferences public standpipe users preferences.

	Sample	Household preferring standpipes at K 2 to K 3	Households preferring wells with handpump free of charge	N/A
Kasama	(0)			
Mbala	(25)	20	3	2
Mporokoso	(8)	8		
Nseluka	(0)			
Kawambwa	(4)	2	2	
Nchelenge & Kashikishi	(12)	11		1
Total	(49)	41	5	3

84% of consumers presently using public standpipes express a preference for this technology at a monthly fee of K 2 to K 3, instead of paying nothing for access to a well with handpump. 10% would prefer the latter, whereas 6% would not answer.

When people have become used to access to a piped water supply system, they usually consider wells with windlass or handpump as a step back, which they are usually not willing to take. If we compare the two groups of low service consumers we find that standpipe users, even if they sometimes have a very unreliable supply, state a preference for a handpump free of charge (as versus a standpipe at K 2 to K 3 per month) in only 13% of the answers. Traditional source users state a preference for a handpump in 27% of the answers. It is likely that economic ability is a major influencing factor in shaping these answers as summarised in Table 3.26 below.

Table 3.26. Low service consumers' supply preferences. Traditional source users' preferences.

Sample		Households preferring standpipes at K 2 to K 3	Households preferring wells with handpump, free	Either is acceptable	N/A
Kasama	(33)	22	4	6	1
Mbala	(11)	9	2		
Mporokoso	(1)				1
Nseluka	(12)	7	4		1
Kawambwa	(3)	2	1		
Total	(60)	40	11	6	3

70% of those expressing a preference stated that they would like a good functioning public standpipe at K 2 to K 3 per month.

3.21. Conclusions for Low Service Rates.

1. It is probable that there would be widespread resistance to paying monthly rates for wells equipped with handpumps. It is considered that any attempts to charge consumers regularly would meet with failure. Furthermore, while a willingness to contribute towards repair costs does exist, it is considered unlikely that collection by government would prove successful.

2. Among Communal Standpipe Users there is ability and willingness to pay K 2 per month for continued access, but 10% say they are too poor and would prefer a well with handpump free of charge. Among Traditional Source Users 30% say they are too poor to pay K 2 and would therefore prefer a well with handpump free of charge. Where piped water is concerned, disconnections are the legalised procedure, and in towns where this is institutionalised as a regular measure against defaulters, the collection rate is better than average.

3. According to interviews with administrative personnel within the water sector (Main Report), most were of the opinion that all consumers who are supplied with tap water must pay.

The collection problem facing the authorities is great. A large percentage of consumers of all categories get away with paying too little or nothing.

A method used for communal standpipe users shows a fairly good rate of success when tried. Local water authorities put guards on every communal tap for one or two days and refuse anybody who does not have a receipt for payment to draw water. Percentage of collection is good during the months when this procedure is carried out, but no locality was found where the procedure took place regularly every month. If and when this was institutionalised, collection procedures would gradually become smoother.

4. See 2.17: Determination of Appropriate Monthly Charges.

3.22. Communal Standpipe Users' Wish for Their Own Connection.

Communal standpipe users in the formal township areas were asked whether or not they would like their own connection. The results are presented in Table 3.27.

Table 3.27. Communal standpipe consumers wish for their own connection.

	Sample	Yes	No, too expensive	N/A
Kasama	(0)			
Mbala	(25)	24		1
Mporokoso	(8)	7	1	
Nseluka	(0)			
Kawambwa	(4)	4		
Nshelenge & Kashikishi	(12)	12		
Total	(49)	47	1	1

96% of present public standpipe users would like their own connection.

The answers to this type of question must be treated with caution since although some respondents will base their answer on whether or not they think they can afford a connection, others may say yes without seriously considering whether they can afford it.

3.23. Traditional Source Users' Higher Service Supply Preference.

Interviewees who currently obtain their water from traditional sources were asked whether they would prefer to have their own connection or to have access to a public standpipe. The results are presented in Table 3.28.

Table 3.28. Traditional source users' higher service supply preference.

	Sample	Public standpipe	Private connection	Either is acceptable	N/A
Kasama	(33)	12	15	3	3
Mbala	(11)		3	6	2
Mporokoso	(1)	1			
Nseluka	(12)		10	1	1
Kawambwa	(3)	1	1		1
Total	(60)	14	29	10	7

Out of the 43 households expressing definite preferences, 67% would like a private connection.

As discussed above, answers to this type of question must be treated with caution. The expressed high desire of rural consumers for their own connections would not represent effective demand. The latter is discussed below.

3.24. Low Service Consumers' Willingness to Pay Monthly Rates for Their Own Connection.

All interviewees were asked how much they would be willing to pay as a regular monthly water rate for their own connection. Interviewers were supposed to put two separate questions:

i) How much would they be willing to pay monthly for their own individual standpipes, and

ii) how much would they be willing to pay monthly for their own house connection.

Unfortunately the interview sheets often only show one answer. It is not always possible to determine to which question the answer applies.

Table 3.29. Willingness to pay monthly water rates for individual standpipe or house connection. Standpipe users' answers.

Sample	K 0 to K 1	K 1.10 to K 2	K 2.10 to K 4	K 5	K 5.10 to K 10	N/A
Kasama (0)						
Mbala (25)		1	21	3		
Mporokoso(8)			5		2	1
Nseluka						
Kawambwa (4)		4				
Nchelenge(12)						
& Kashikishi		4	1	7		
Total (49)		9	27	10	2	1

75% were willing to pay K 4 or less per month, whereas 25% stated a willingness to pay K 5 or above. The median willingness to pay is between K 2.10 and K 4.

Table 3.30. Willingness to pay monthly water rates for a communal standpipe. Traditional source users' answers.

	Nil	K 0.10 to K 1	K 1.10 to K 2	K 2.10 to K 4	K 5	Over K 10	N/A
Kasama	2	1	2	1	2	1	24
Mbala		2					9
Mporokoso							1
Nseluka			1				11
Kawambwa							3
Total	2	3	3	1	2	1	48

It should be noted that the large number of no-answers (N/A) to the question is not due to unwillingness on the part of the interviewee. It was wrongly assumed by the interviewer that an answer to one of the questions, i.e. willingness to pay for an individual standpipe or a house connection, was sought. However, some informants did answer both questions, which is why Table 3.30 and Table 3.31 make up more than 100% of the sample size.

Table 3.31. Willingness to pay monthly water rates for a private standpipe. Traditional source users.

	Nil	K 0.10 to K 1	K 1.10 to K 2	K 2.10 to K 4	K 5	K 5.10 to K 10	Over K 10	N/A
Kasama	2	1	4	11	6	2	3	2
Mbala		1	1	2				6
Mporokoso			1					
Nseluka		1	3	4				3
Kawambwa				1				2
Total	2	3	9	18	6	2	3	13

The median willingness to pay for a communal standpipe is K 1.10 to K 2. The median willingness to pay for a private standpipe is K 2.10 to K 4. Thus, traditional source users express a willingness to pay for a private standpipe the same median amount as public standpipe users will pay for an individual standpipe or a house connection. In both cases we find that 15% are willing to pay K 4 or less, and 25% are willing to pay K 5 or more.

Their willingness to pay for an individual standpipe is about double their willingness to pay for a communal standpipe.

It was believed that the answers to the open question of how much they were willing to pay could underestimate the true willingness to pay. A major reason for this is that consumers' responses will be partly influenced by what they are paying today. This hypothesis was put to the test by asking Low Service interviewees whether they would be willing to pay K 5-8 per month for their own connection. The results are summarised in Tables 3.32 and 3.33.

Table 3.32. Standpipe users' willingness to pay K 5 to K 8 monthly for a private standpipe.

	Sample	Willing to pay K 5 to K 8	Not willing to pay K 5 to K 8	N/A
Kasama	(0)			
Mbala	(25)	24	1	
Mporokoso	(8)	7	1	
Nseluka	(0)			
Kawambwa	(4)		4	
Nchelenge & Kashikishi	(12)	9	2	1
Total	(49)	40	8	1

Table 3.33. Traditional source users' willingness to pay K 5 to K 8 for a private standpipe.

	Sample	Willing to pay K 5 to K 8	Not willing to pay K 5 to K 8	N/A
Kasama	(33)	26	6	1
Mbala	(11)	7	3	1
Mporokoso	(1)		1	
Nseluka	(12)	6	6	
Kawambwa	(3)	1	2	
Total	(60)	40	18	2

Whereas 83% of those presently using communal standpipes stated a willingness to pay K 5 to K 8, only 67% of those presently using traditional sources expressed such willingness. Partly, this is interpreted as reflecting differing economic ability between the groups, partly it reflects that access to even a shared standpipe is a significant improvement for traditional source users. There is, however, a great expressed willingness to pay for higher levels of service amongst the present Low Service population. To the open question about willingness to pay rates for a private standpipe (Table 3.31.): 75% of traditional source users were willing to pay K 4 or less. To the concrete question in Table 3.31 67% state a willingness to pay K 5 to K 8, although many informants asked the interviewer to cross out K 8 and leave in only K 5. For the group presently using communal standpipes, the percentages to the same

questions are 75% (Table 3.29) willing to pay K 4 or less, and 82% willing to pay K 5 to K 8. The interviewees who would not pay K 5 to K 8 per month for a private standpipe, said they were too poor. According to informants' own statements, there are thus 16% of communal standpipe users and 30% of traditional service users who are too poor to pay K 5 to K 8 per month for water.

Thus, although Tables 3.32 and 3.33 suggest that the direct willingness to pay question did in fact underestimate the true level of willingness to pay, it could be argued that the question of "would you be willing to pay K 5-8 per month" may overestimate the willingness to pay. This is due to peoples' propensity to answer yes when a question requiring a yes- or no answer is put to them. However, even if the tables do overestimate the willingness of Low Service consumers to pay water rates, it is clear that the willingness to pay is still high, and many consumers who would be willing to pay existing rates do not have their own connection.

It is believed that there are three main reasons why this apparent willingness to pay monthly rates has not been translated into more connections. Firstly, the implementation capacity of DWA in many townships to provide new connections is extremely limited and sometimes borders on non-existent. Secondly, the willingness to pay for new connections is far below the level of today's connection fees. Thirdly, most of the housing in the Low Service formal township areas belongs to the government and councils, thus complicating the connection issue.

However, Section 3.26 shows that the real dampening influence on the effective demand for house connections in the shanty and rural areas will probably be the connection fee. This has two aspects,

a) the amount and the consumers' ability to pay
b) the possibility of enjoying a long-term benefit from such payment.

The latter aspect is treated in Section 3.25 below.

3.25. Residential Stability.

In order for consumers to be willing to pay a connection fee of some size they must feel confident that either

a) they can continue to live in their present house, or
b) they will be refunded the connection fee if they for some reason have to move.

As will be seen from Table 3.34 below, Zambians feel they are facing uncertainties in this connection.

Table 3.34. Low Service Consumers' fear of eviction.

Sample	Fearing they may have to move	Not fearing they may have to move	N/A
Kasama	10	4	19
Mbala	34	2	
Mporokoso	5	4	
Nseluka	9		3
Kawambwa		7	
Nchelenge & Kashikishi	1	11	
Total	59	28	22

The major causes of residential instability are:

a) Losing their jobs or being transferred in connection with their job.
b) Being evicted from the land on which their house is built. In many informal housing areas this is a prevailing fear and in fact, interviewers were sometimes thought to be spies for the authorities planning eviction.
c) Social stress pertaining to tribalism, witchcraft accusations, war-like activities from neighbouring states, etc.

There are large differences between the locations as to fears of eviction, ranging form almost a hundred percent in Mbala to only about 5% in Luapula Province. The consultant can give no satisfactory explanation of this. Of the 80% households answering the question, 68% feared to have to move for one reason or other. Section 3.26 below should probably be seen in the light of these findings as well as in the light of economic ability.

3.26. Willingness to Pay Connection Fees.

Low Service consumers were asked how much they would be willing to pay to be connected to a piped water supply, bearing in mind that they would subsequently have to pay monthly rates.

Consumers were asked what would be the maximum connection fee they would be willing to pay for either

i) their own standpipe, or

ii) their own house connection.

The question has been misunderstood by some interviewers and informants, i.e. it is uncertain whether the answers given apply to i) or ii). The results are presented in Tables 3.35 and 3.36 below.

Table 3.35. Low Service consumers' willingness to pay connection fees. Communal standpipe users.

		Number of respondents willing to pay						
Sample		Any amount decided by government	K 4	K 5	K 10 to 20	K 20 to 50	Over K 50	N/A
Kasama	(0)							
Mbala	(25)	4	4	1	17			
Mporokoso	(8)			1	1	3	2	1
Nseluka	(0)							
Kawambwa	(4)				4			
Nchelenge & Kashikishi	(12)		2		7	3		
Total		4	6	2	29	6	2	1

Table 3.36. Low Service consumers' willingness to pay connection fees. Traditional source users.

	Number of respondents willing to pay						
	Nil	K 0 to K 1	K 1.10 to K 2	K 2.10 to K 4	K 5	K 5.10 to K 10	Over K 10
Kasama	2	2	1	5	6	3	9
Mbala		2		1		1	
Mporokoso							
Nseluka	1	1	1	5		3	
Kawambwa						1	1
Total	3	5	2	11	6	8	10

About 60% of the present communal standpipe users are willing to pay K 10 to K 20 in connection fee for a private standpipe or a house connection, whereas only 22% of traditional source users are willing to pay over K 10. One household in the former category and 15 households in the latter category refused to answer the question. In the latter category 22% of the respondents were willing to pay K 2 or less.

It can be seen that the willingness to pay connection fees even by those consumers willing to pay monthly rates of K 5+ is rather limited. The median willingness to pay connection fees is K 10 to K 20 for communal standpipe users and K 6 for traditional source users.

Hence it can be concluded that the current connection fee of K 100 would deter nearly all Low Service consumers who are willing to pay the monthly bills associated with a higher service from taking up their own connection.

4. DISEASE AWARENESS

Consumers were asked whether they knew what causes diarrhoea, (a water borne/water washed disease) and scabies, (a water washed disease). The objective of the question was to determine the level of consumer awareness of the causes of the diseases and hence the value of

a) pure water and

b) sufficient water for adequate washing.

The summarised results of the interviewees' awareness of the causes of diarrhoea and scabies are shown in Tables 4.1 and 4.2.

Table 4.1. Low Service consumers' awareness of the causes of diarrhoea and scabies.

	Water related	Other	Don't know	N/A
Diarrhoea				
Kasama	24	8		1
Mbala	10	25		1
Mporokoso	4	3		2
Nseluka	3	9		
Kawambwa	6			3
Nchelenge & Kashikishi	10	1		1
Total	57 = 52%	46 = 42%		8 = 6%
Scabies				
Kasama	19	9	4	1
Mbala	21	14		1
Mporokoso	6	1		2
Nseluka	11			1
Kawambwa	4	2		1
Nchelenge & Kashikishi	9	2		1
Total	70 = 64%	28 = 26%	4 = 4%	7 = 6%

Table 4.2. High Service consumers' awareness of the causes of diarrhoea and scabies.

	Water related	Other	Don't know	N/A
Diarrhoea				
Kasama	31	3		
Mbala	2	10		
Misamfu	30	3	4	2
Mporokoso	7	1		1
Luwingu	9			
Total	79 = 77%	17 = 16%	4 = 4%	3 = 3%
Scabies:				
Kasama	16	13	4	1
Mbala	10	2		
Misamfu	26	7	2	4
Mporokoso	6			3
Luwingu	6	3		
Total	64 = 62%	25 = 24%	6 = 6%	8 = 8%

In connection with scabies, which shows a high similarity in answers between the two groups, many informants believed the disease to be due to bad weather and contamination by dogs. Lack of soap was not mentioned as often as bad chemicals in the available soaps.

In connection with diarrhoea there are significant differences in knowledge and belief between the different areas. In Mbala 70% of the Low Service consumers and 83% of the High Service consumers did not state a water-related cause for the disease. Low Service consumers in Mporokoso stated lack of knowledge and causes other than water-related in 55% of the answers, whereas the percentage for High Service consumers was 22%. In Nseluka there was a 100% apprehension that their water sources were polluted, (see Table 3.12), but only 30% of the informants state that diarrhoea may have water-related causes.

Table 4.3. Differences in awareness of the causes of diarrhoea and scabies in the High Service consumer group/Low Service consumer group.

	Water related	Other	Don't know	N/A
Diarrhoea:				
High Service	77%	16%	4%	3%
Low Service	52%	42%		6%
Scabies:				
High Service	62%	24%	6%	8%
Low Service	64%	26%	4%	6%

Almost 50% of the Low Service sample did not connect the causes of diarrhoea to water. The percentage is significantly higher than in the High Service consumer group (20%), as would be expected due to differences in level of education. However, as will have been seen from the above and as was found in Katete, disease awareness is some times better in rural and Low Service consumer groups. The most plausible reason for this is that health personnel have been more active in some localities.

It seems fairly evident that a health education campaign is warranted if new or improved water supplies are to have significant health benefits. It is tentatively assumed that if the population is taught about the benefits ensuing from optimal use of improved water sources this may lead to less pollution, less waste and better operation and maintenance.

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