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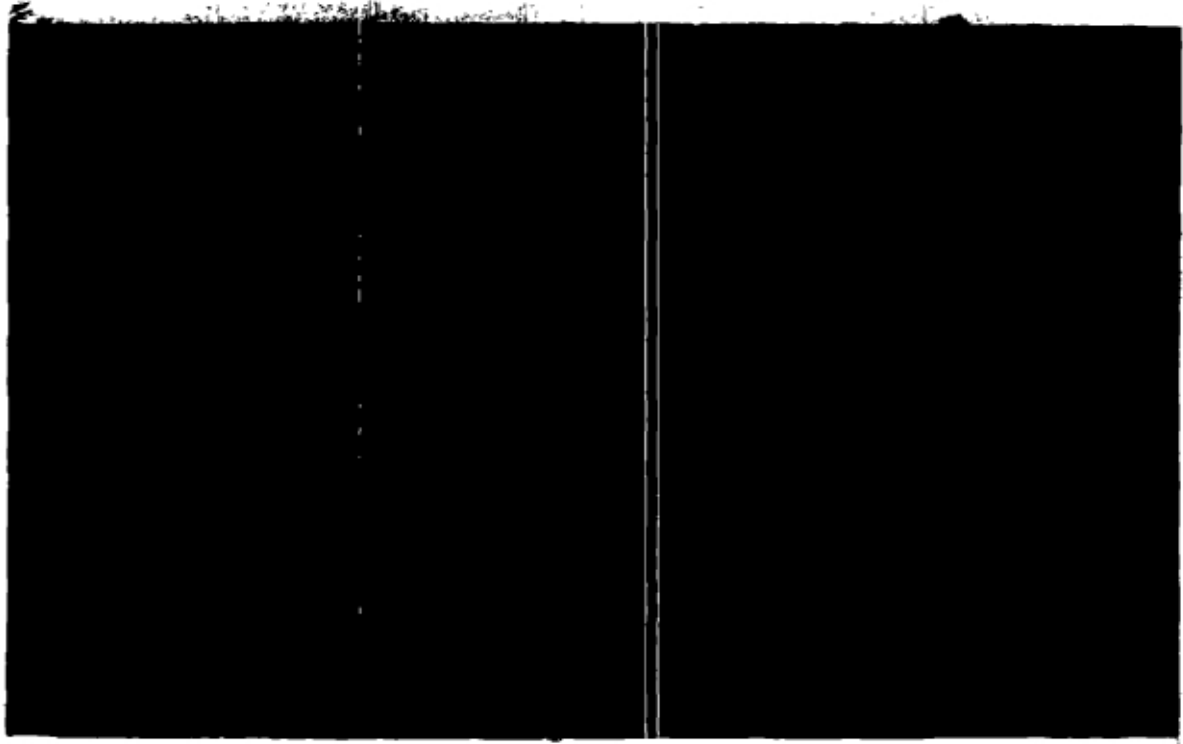
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Mzuzu, August 1993



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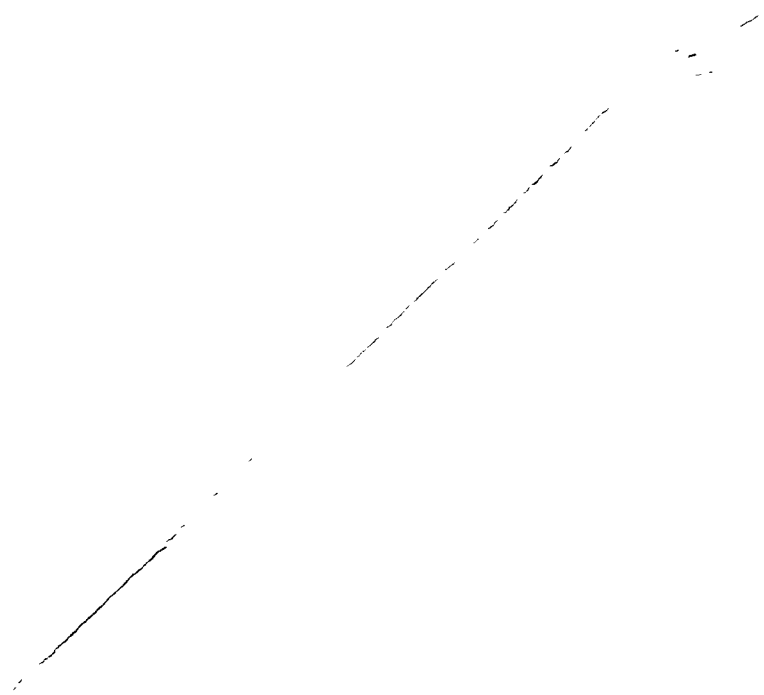
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Marcel van Dorst
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Mzuzu, August 1993



Mpopi (August 1988)

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... the ... per capita ...

... where people can stand while filling the bucket and where they can put the bucket before lifting it to their head.

... and becomes sick by getting in contact with parts of the construction and ... epidemic disease.

... 66,000 ...

... Skip "whenever anything is going wrong";

... credit

... People are aware of the quality of the tap-water

... addition ...

... (see ...)

36. If the price per month of water is increasing are you still able to be a consumer of the Communal Water Point?									
Indic. 8	CWP	6	24	32	34	37	56	62	Avg
Yes %		49	78	64	47	38	41	58	54
No %		17	17	19	42	57	43	34	33
No answer %		34	4	17	11	5	16	8	14
False %		0	0	0	0	0	0	0	0

42. Do you think it is fair to pay for the water?									
Indic. 8	CWP	6	24	32	34	37	56	62	Avg
No %		51	17	17	20	38	43	19	29
- Must be a social service provided by the government %									
		50	50	75	11	63	33	70	50
- The necessities of life %									
		11	25	0	33	13	5	30	17
- Other people are also not paying %									
		6	0	0	56	0	5	0	10
- Do not know %									
		6	0	0	0	0	14	0	3
- No answer %									
		28	25	25	11	25	43	10	24
- More than one answer %									
		0	0	0	-11	0	0	-10	-3
Yes %		11	43	47	36	29	18	36	31
- Treated water %									
		50	50	50	38	33	33	32	41
- Near to my house %									
		25	20	5	13	0	0	5	10
- Taste is good %									
		50	20	0	31	0	0	0	14
- Causing no diseases %									
		50	30	18	43	33	11	32	31
- Fresh %									
		25	20	14	19	0	11	5	13
- Reliable %									
		0	20	0	19	0	0	5	6
- Do not know %									
		0	0	0	0	0	0	0	0
- No answer %									
		0	40	32	31	33	67	37	34
- More than one answer %									
		-100	-18	-94	0	-22	-16	-50	
No answer %		26	4	11	4	5	6	4	9
False %		11	35	26	40	29	33	42	31

MPOPI

A micro-research on Communal Water Points in the city of Mzuzu

This report is supported by a version of annexes

Study Assignment

Catchword: Water Supply, Peri-urban,
Community Management

Marcel van Dorst
Juil de Ridder
Mzuzu, August 1993

To the families of the Communal Water Points.

FOREWORD

In Malawi, the word "mpopi" is related to the English word "pump". The word is used for all kind of objects which supply water.

To fulfil the final thesis of our study International Land & Water Management at the College of Forestry and Land & Water Management we went to the Republic of Malawi to the city of Mzuzu.

During the fourth year of the course the interest from Marcel for social economic aspects of projects was growing. Interest in water supply was growing for Juul after her practical period in 1992 in a dry part of Africa.

After discussing this with our teacher of Rural Water Supply and Sanitation, we got the opportunity to go to Malawi to do a micro-research on community based urban water supply.

During the research we were assisted by Mr K.J.Msukwa, the Monitoring Assistant for Communal Water Points. Almost every time when we went into the field he was joining us. He was our Chitumbuka interpreter in the field. We are very grateful for that. A lot of information we got from the people of the Communal Water Points. We like to thank them for their cooperation.

We want to thank the Chief Water Supply Officer, Mr Kankhulungo, and the Project Manager of Community Based Water Development, Mr Kwaule, for giving us the opportunity of doing the research in Malawi and escorting us to Mzuzu.

We also want to thank the Water Department staff in Mzuzu. They were always friendly and willing to assist us by answering our questions.

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Annex 24	Primary Workplan and adjustments

List of Abbreviations

CC	- City Council
CWP	- Communal Water Point
DSWF	- District Water Supply Fund
GoM	- Government of Malawi
hh	- household
MA	- Monitoring Assistant
MCP	- Malawi Congress Party
MEP	- Minimum Evaluation Procedure
MK	- Malawian Kwacha (currency)
MR	- Meter Reader
WC	- Ward Councillor
PSSC	- Piped Supplies for Small Communities project
O&M	- Operation & Maintenance
RCW	- Regional Control of Works
WD	- Water Department
WHO	- World Health Organisation

SUMMARY

This micro-research on Communal Water Points in the city of Mzuzu is carried out to look for factors which demonstrate why a CWP and CWP-scheme is functioning. Mzuzu is a relatively large town, representative for an increasing number of rural towns in Africa. The city of Mzuzu has 62 operating CWP's, constructed by the Water Department (WD) in the years 1984/1985, which did not get any external support after constructing. This CWP-project was launched in the whole of Malawi in order to provide water to peri-urban dwellers who could not afford their own private water connection. The consumers of the CWP had to form a tap committee and to undertake the management of the tap point and pay for the water that is offered at a subsidized tariff rate.

To look for the factors why this system of water supply is functioning nine indicators are developed. *and how* These indicators are used to see how the CWP and CWP-scheme is scoring on. The information, gathered for the research, is obtained mainly through interviews with WD staff and peace corps volunteers from City Council, fieldvisits to the CWP's and inquiries hold at eight CWP's. The nine indicators are: Waterquality, Waterquantity, Reliability of water supply, Convenience of the water point, Proportion of household using the facility, Volume of water use and for what purpose, Organisation and Payment.

A CWP-scheme and CWP should have the capacity to supply the water need of the people in the community for who it was constructed. That means a community of not more than 30-40 households per CWP. The water need is 30 litres per person per day, according to WD guidelines and guidelines of WHO for standposts '83 (Ref.1 & 6). The actual consumption is between 12 and 17 litres per person per day. This stays far behind the supposed consumption and this has to be taken as a serious problem. ←

The people of the community have to be aware of the quality of the water. People are aware of diseases, but there is no difference in opinion between good and bad performed CWP's. The water provided at the CWP is treated at the city treatment works. The tap water should not contain any bacteriological pollution and must have acceptable chemical proportions. The water tested at the tap did not contain any bacteriological pollution, but also no signs of chlorine. It also has to be tasteful to drink. The communities find the water good for drinking.

Most of the CWP's had unhygienic surroundings, which could influence the water quality.

The water supply has to provide water all the time, throughout the year. The water supply in general is good, water is coming from the taps most of the time. However, some CWP's have pressure problems and stay without water most of the day. These are CWP numbers 16,21,22,24 and 58. It are those people how suffer. ←

The appearance of the water point has to be accessible and attainable; it should not be more than 250m from the house of the consumers and not more than 30-40 households per CWP (Ref.10). The average number of households for this scheme is 56 with a variation between 17 and 120 households. The target did not comply to the actual situation. Some of the CWP's are far overcrowded. The CWP-scheme has not failed in this case, because more people benefit the treated water. The conclusion is that demand exceeds the supply. The average distance of the CWP to the house for the community is not more than 250 metres. However, it happens people are walking more than 1.5 kilometre to a CWP. The appearance should be the same like it was constructed. In most cases this was not so. Only a few of them had a proper structure. Drains and taps were broken frequently and standing areas were not filled with little stones. WD does not have all the spare parts in stock. There is also dissatisfaction about the opening hours.

The water offered via the CWP is meant to be used by everybody in the community. 45% of the population of the city remain without treated water supply through the piped system. Further investigation has to be done to find out where these people are taking their water from. However, all the family members within the CWP community use the water from the tap. ?

The water from the CWP should be used for all water needs as drinking, cooking, washing of food and utensils, personal washing and washing of clothes. It can be said that the water is used for all the important needs. At some places the tap water is also used for other activities.

The organisations concerning operation and maintenance of the CWP should comply with the responsibility guidelines. At scheme level the organisation is not always working like it has to be. Most of the committees however, chosen in a democratic way, are working concerning payment. The users of the CWP's are not aware of all the guidelines.

The payment of the community should correspond to the amount of water taken from the waterpoint; the balance of payment should be a credit or break-even. At scheme level the balance is in a high credit although some CWP's have a large debit. Committee members come to the cashier office monthly to pay for water. The people are prepared to pay for the water. They find the price for the water acceptable. *how come?* ?

If an educational message is well understood and brought in practice the operation and maintenance of the CWP should be in good condition. Education (concerning hygiene, maintenance etc.) is not given in regular periods and is not always that good.

There are interrelations between the indicators. Where education plays probably the most important role. People have to be told what to do and why, when something like a CWP is carried over to them.

Problems in getting water from the tap due to pressure problems or a large number of households results in a decrease of volume of water consumed. Stagnating water around the tap side may contaminate the tap water and so influences the quality.

When an organisation is not working properly it results in bad educated people and so bad operated CWP's.

People are used to pay for city services. The people from the lower class income group do not have many alternatives if they want to use treated water than to use the water from a CWP and pay for it. The advantage is that the CWP's are not very far from their houses and also the cashier's office remains in the city centre. Women in general do not abuse the money. ?

Because safe water is coming from the taps most of the time the CWP is a very reliable source.

The successful factors are: In spite of a lot of defects at the CWP, people are not discouraged from using the water point, community financial management is working well due to discipline, the tap water is used for all the household needs, the water supply system is reliable due to electricity pumps at treatment works and because the electricity supply is reliable, the acceptable price of water.

1 INTRODUCTION

Community based urban water supply in Malawi can be seen as a success. Water is running from the taps and users are paying for the water. A good example for such successful performance is the city of Mzuzu. It has the largest Communal Water Point (CWP) scheme of Malawi and represents a number of increasing rural towns. A CWP is a tap construction connected on the piped water supply system of the city. It is meant for those families who cannot afford their own individual connection. The scheme has been operating without any external support since 1984. It can be said that the scheme is functioning. It is the successful performance of this scheme that the research wants to focus upon. When we think about the successful performance several questions are risen.

*ratio CWP
users to
private taps
owners
?*

- What have been the technical characteristics of successful Operation & Maintenance at scheme level and at standpost level? (reliability of supply, efficiency of repair, maintenance and operation, general demand, etc.)
- What have been the financial performances of the CWP's at scheme and standpost level? (income and expenditure, financial discipline, money collection procedures, administration and registration etc.)
- What have been the key characteristics of the different directly involved institutions at scheme and standpost level? (responsibilities of WD and Standpost Committees, composition and structure of user groups, structure and composition of WD staff in support of CWP schemes etc.).
- What are the main characteristics of the users of the CWP's? (characteristics of CWP's households, distance to CWP's and alternative water sources of different quality etc.)

The problem:

Since the scheme has been operating no analysis has been made. There is no indication why the scheme is functioning. The question which is rising is:

"Are there demonstrable factors which indicate why a CWP and a CWP-scheme is functioning?"

The objective:

It can not be the intention of this research to find the formula for successful performed CWP-schemes in urban areas. Neither to find the solution for adjustments to schemes which did not performed well or make proposals for improvement.

What can be done is to look for the underlying factors which indicate why this particular scheme is functioning. So the objective of this micro-research will be: "To look for factors which demonstrate why a CWP and a CWP-scheme is functioning."

To comply with the objective of the research a logical method has to be found to collect data and evaluate this. It will be discussed in chapter 2, Methodology. Before the evaluation a general overview of the country, city and CWP-project is given in chapter 3, Sector overview. The collected data will be discussed in the following chapter 4. In chapter 5 conclusions are made. In the same chapter we find if the research fulfilled the objective.

2 METHODOLOGY

There are different methods for collecting information and evaluating it. One way of getting your information is just ask anything concerning CWP's that crosses your mind. This can be done on both CWP level and scheme level. With all the answers collected you can look for relations and draw conclusions. A disadvantage of this method is that you may forget important issues and do not find all the relations there are. You may get guided by the information instead of selecting the information you need. With small changes in the situation the outcome can not easily be predicted.

The reason why a scheme or CWP is functioning depends on the different aspects. An instrument that deals with these aspects are indicators. By looking at the CWP and CWP scheme through indicators factors for the successful performance may be determined.

That is why the decision was to do the research more structural and probably more detailed. First of all the available literature concerning the CWP's was studied. All questions risen from this were written down. Some of this already was done in the Netherlands. In Malawi more information including resource persons was checked. The information was discussed on relevancy for the research. All the questions which could be asked directly through staff of different sections of Water Department (WD) and other persons, like peace corps volunteers working for City Council (CC) were placed in interviews and informal conversations. Meanwhile we visited all the CWP's in the field. For these visits a form was made to fill in the appearance of the structure (annex 2). During the visit every remark said and our own opinion about the situation were noted down. From this fieldvisit a data record for every CWP was made in DbaseIII. All the collected financial and consumption information of each CWP was put in the spreadsheet programme Lotus. At the end of the visits there was a complete database for each CWP.

A 10-15 % coverage would result in a proper outcome of the situation, so 7 of the 62 CWP's should be selected. To know on what conditions to select these 7 CWP, a evaluation procedure used by WHO called MEP, Minimum Evaluation Procedure (Ref.6), was adopted. The procedure is not used in his complete form, because this procedure also includes recommendations as activities to be taken to get a system back functioning again, modification for future project and so forth. However, the way of dealing with performance indicators is the same. For this procedure a selection of indicators had to be made on which the information could be tested. According to the problem of the research and the information gathered a total of 9 indicators were selected. For each indicator, except for indicator "Proportion of household using the facility" and "Volume of water use and for what purposes", a selection for the 7 CWP's was made on basis of the available data.

list A

inter. with
res persons

observation

talks with
users ?

selection
of CWP's

- For indicator "Waterquantity" the selection was made on high and low consumption per household, looking at household number and monthly average water use. CWP's of which the meter was not running were not enclosed in the selection.
- The selection for indicator "Waterquality" was based on the appearance of the CWP and the surroundings, looking at bad and good appearance. This could say something about the awareness of the importance of safe drinking water.
- The selection for indicator "Reliability of the water supply" was based on low pressure and lack of water, noted during the fieldvisits.
- For indicator "Convenience of the water supply" the selection was made on appearance of the CWP, like broken taps, erosion and high and low amount of households using the facility, which could say something about the waiting hours at the tap.
- The selection for indicator "Organisation" was made on regular and un-regular payment, payment of regular amounts and community initiative like a selfmade drain, well maintained standing area and taps protected against theft.
- For indicator "Payment" the selection was based on high credit or debit balance.
- The selection for indicator "Education" was made on the educational talks the MA gave during the fieldvisits, like pointing people on the dirty platform, contaminated water in the meterchamber, washing at the tap site and not reporting damages.

For each indicator a hypothesis is made. From this hypothesis, questions were drawn. The questions were put in a questionnaire and translated in Chichewa (national language). To get proper information on CWP level (information for the CWP in general and the opinion of an individual), a form was made which could be handed out to every individual that appeared on the day of the inquiry. The reason for choosing Chichewa instead of Chitumbuka (language of the district) is that everybody who knows how to write and to read also can understand Chichewa, because this is a subject at primary school.

question users

In order to know if the questions would be understood and which percentage could read and write a pilot testing was done. The CWP for the test was chosen at random. The appointment with the community for the testing was made the day before. At the test was found that almost everybody knows how to read and write, so there was no reason of changing the way of questioning. However, some questions were misunderstood and needed to be changed, the questionnaire was also too long so a few questions had to be skipped (annex 3). After the questionnaire was changed, it was checked again on translation mistakes and things that could be misunderstood (annex 3). The person who checked the questionnaire was well up in both Chichewa and English. However, you do not know how somebody else would interpret a certain question. The meetings at the 7 CWP's were established in two weeks. The users of the CWP's were informed about the meeting in advance. During the inquiry everybody accepted to fill in the questionnaire except the illiterates.

of the users? illit-

In the beginning the participants were afraid to fill in the questionnaire because they did not understand for what purposes it would be used. The answers were worked out in tables to make them easy to evaluate (annex 4). The results together with other relevant obtained data is discussed under the different indicators.

*Method
not
partic.,
was the
a ...*

There are relations between the indicators, which you can not exclude during the analysis of each indicator, but because of collecting the information for each indicator individual isolated it will have more profundity.

The research is done according to the draft workplan (annex 24).

3 SECTOR OVERVIEW

First a top-down overview is given to focus on the Communal Water Points.

- Malawi

Malawi is located in the southern part of East African Rift Valley and lies between nine degrees and 17 degrees south of the equator. It covers a surface area of 119,140 square kilometres of which the Lake Malawi occupies about 20 per cent. It is bounded by Tanzania in the east and the north, Mozambique in the south and the east and Zambia in the west (annex 5).

Malawi received full independence from the United Kingdom in 1964 and became a republic in 1966. The country's administrative system is organized around three levels of public administration: Central Government, Local Government and Traditional Authorities. Since 1966 the country is ruled by the life president Dr Kamuzu Banda. Up till now there is a one party system. This will change soon considering the referendum of June 1993 which resulted in a multiparty system. Since January 1993 the people are free to speak openly about politics which was unthinkable before.

- CWP project

The Communal Water Point project was launched in 1981 in the whole of Malawi. The aim was to cater for and mobilise small urban fringe communities which could not afford private water connections because of low incomes, to participate in the supply and management of piped water in their area's. In order to provide water to peri-urban dwellers the WD has embarked on a Communal Water Point (CWP) programme. Under this programme, which is funded jointly by GOM and a grant from the United Nations Capital Development Programme (UNDCF), CWP's are being installed at locations where a demand has been identified, through community participation. The project had technical assistance from UNDP and WHO. The cost of the connection (annex 6) is paid for through the grant, provided the consumers agree to form themselves into a tap committee and undertake to manage the tap and pay for the water consumed at a subsidized tariff rate (annex 18). The programme has gained great impetus and has provided potable water to sections of the population who would otherwise not have been able to have had access to safe water(Ref.8). The WD was previously a division of the Department of Lands, Valuation and Water, but in October 1984 the entire division was transferred to the Ministry of Works and Supply. The WD has two branches, Water Resource and Water Supply. The Water Supply Branch of the WD is responsible for the supply of treated water to all major towns except the cities of Blantyre and Lilongwe which have their respective Water Boards. The branch also plans, designs, constructs and operates some institutional water supply schemes. Besides the urban water supplies, the branch provides untreated but protected piped gravity water supplies to rural areas where ever feasible.

- Mzuzu

Mzuzu water supply started in 1959. Now a days there are 2564 individual connections, included hospitals, schools, houses and so forth.

Mzuzu experiences some of the heaviest rainfall in the country and relatively low temperatures. The mean annual rainfall is approximately 1200mm with mean annual temperatures of 10-12°C. The wettest months are December to May with a cold, dry period June to August. The hottest period is September - November before the onset of the rains. The city of Mzuzu is the centre of the northern region and has a fast growing population. At present it has an approximate population of 66,400 (deduced from the last census 1987 which was 44,238, growthrate of 7%).

In terms of age structure there is a strong dominance by the younger age groups (i.e. 0-4 and 5-14). 46% of the population was within these age groups in 1987. This compare with 44% in 1977 and the increase has been largely in the 5-14 school age groups. A further 52% of the population are of an age when they can expect to be economically active. Finally the percentage of the population over 60 is about 2%. The population in the age groups which are dependent on the economically active is therefore nearly 48% of the total population.

With the declaration of Mzuzu as a land control area most land within the city boundary became public land. Before the land can be used or developed on a permanent basis it must be leased either directly from Government through the Department of Lands and Valuation or via Malawi Housing Corporation or the CC where they are developed under the Secondary Centres Development Project for example the CC will be responsible for sub-leasing to developers.

However, there are area's within the city which are not at present allocated for any particular use mainly on the city fringes where customary land allocation is still practised mainly for traditional development which is not of permanent nature.

One of the main problems relating to land ownership in the city is the lack of up to date records which could prove a serious hindrance to future development. This is an issue which must be addressed by the Department of Lands and Valuation.

- CWP scheme

It was in 1984 that the CWP project started in Mzuzu. At the moment there are 62 CWP's operating (annex 7). These CWP's are found in the traditional housing area's within the boundaries of the city (annex 8). After constructing the CWP's the only contact between WD and the users is through the Monitoring Assistant (MA) and Water Meter Reader (MR).

4 INDICATORS

In this chapter the indicators are worked out. The different levels on which research has taken place are scheme level and CWP level. On CWP level we look at a certain CWP's and the persons connected with that CWP. Scheme level gives an overall view for the situation concerning all CWP's.

With the data collected for each indicator, we look how a certain CWP and the scheme is scoring on that particular indicator and draw conclusions.

In order to understand the appellations of the different parts of the CWP structure we refer to fig.1.

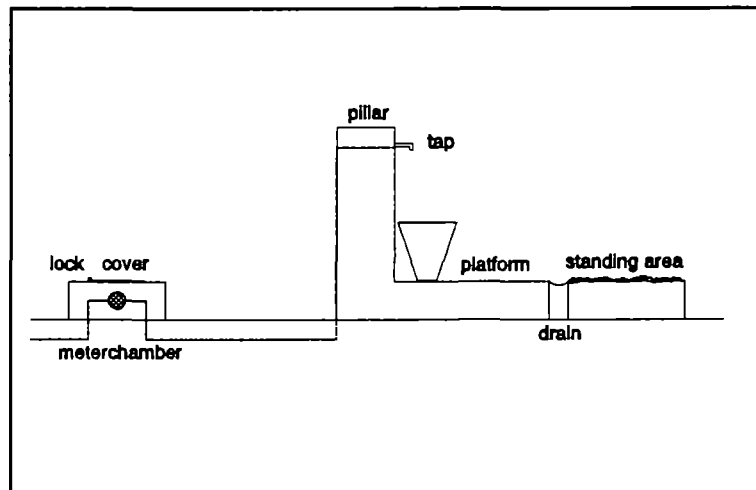


Fig.1 Section of a CWP construction

4.1 WATERQUANTITY

- **Hypothesis:** A good CWP-scheme and CWP should have the capacity to supply the water need of the people in the community for who it was constructed. That means a community of not more than 30-40 households per CWP. The water need is 30 litres per person per day, according to WD guidelines and guidelines of WHO for standposts '83 (Ref.1 & 6).

The theoretical water demand could differ from the actual demand. If the actual water demand is reaching or equals the designed water demand it is important to know that no treated water is wasted in large proportions or the reason why the theoretical demand is just too low.

4.1.1 Analysis data

- Scheme level

The source for the providing of tap water is the Lunyangwa river, which has an average discharge of 418,867 cubic meters per month (source: Lahmeyer consultant). The discharge of the river however, is not constantly. The capacity of the treatment works is 4800 cubic metres per day and this equals the con-

sumption of the city. The 62 CWP are using 7,934 cubic metres per month for 3472 households (average of the year 92/93 of all the CWP within the city). The consumption per capita from individual connections is five times higher than from CWP's (Ref.9). At the question, how many individual connections are within the city, a Water Foreman at the WD answered:

"There must be around 5000 individual connections, but for the exact figure you should ask the meter readers".

That was a good advice. The city has a total of 2564 individual connections. If they are consuming five times more than a CWP, the consumption for the individual connections must be 29,295 cubic metres per month (This figure is only for the households of the individual connections, but the individual connections also include institutions like schools and hospitals as well as beer breweries, dairy etc.).

Let us take a average of 6 persons per household (annex 4). If we assume a individual connection has the same family size,

"A family size in Malawi is about 5-7 persons", says the Project Manager in an interview,

the population served by the piped water supply is about 36,000 people. The largest group served by the piped systems are the people at CWP's, however, they only consuming 5% of the total city consumption.

The explanation is that the average consumption per capita is only 12 litres (addition of all average CWP consumption divided by the total households using the CWP with a household size of 6 persons). This figure may not be the exact water use. In case a water meter is broken an average water use is assumed which is not indicating the actual consumption. Why are they using so little?

There was a question from us during a meeting at CWP 4 if the people knew that the water meter was broken and if so if they were drawing water that time. They knew about the broken meter but did not draw more water.

At the question, how many buckets are collected each day, the average household answers 5 buckets. By observation and measuring some buckets we concluded the average bucket size is around 20 litres. That would mean a consumption of 100 litres per household per day and 17 litres per capita per day.

- CWP level

For this indicator we chose CWP's with a large consumption, a low consumption and a average consumption per household, to look at the factors which indicate the reason for a low or high consumption. One of the CWP's with a low consumption per household is CWP 32. This CWP has a consumption of 0.7 m³/hh/month (average of the year 92/93, annex 2 & 10). The amount of household using this tap is 120, the highest in Mzuzu.

At a CWP with high consumption is 37 which has a consumption per household

of 3.5 m³/month. This CWP has only 21 households. Other CWP's which have a low amount of households are CWP 38 (17 hh) with the largest consumption per household of 4.0 m³/month, CWP 40 (20 hh) with a consumption of 3.9 m³/hh/month and CWP 46 with a consumption of 3.4 m³/hh/month.

For the questionnaire we also selected CWP 6. This CWP has a relative low consumption of 1.9 m³/hh/month and the average amount of 57 households.

4.1.2 Conclusions

The consumption stays far behind the 30 litre per household per day.

The difference between 12(actual) and 17(questionnaire) litres is due some people filled in 5 buckets a day but sometimes they even could not get a single one when there is lack of water. They just filled in the maximum amount of buckets they collect when there is water. A reason for the low consumption rate is that people have to wait a very long time to get a bucket filled. After they filled one, brought home and come back the tap is closed. This is related to the amount of consumers, because the smaller the consumer group the higher is the consumption rate per household. People who do not get enough water from the tap have to add their need with water from a alternative source.

The overpopulation is the mean reason why the consumption per capita is extremely low.

4.2 WATERQUALITY

- **Hypothesis:** The people of the community have to be aware of the quality of the water. The water provided at the CWP is treated at the treatment works. The tap water should not contain any bacteriological pollution and must have acceptable chemical proportions. It also has to be tasteful to drink. (Ref.6). If you want to know if people understand the importance of safe water you have to look how they handle the treated water. Important things for guarantee the safety of the water are storage and transport after the water is taped. Also the appearance of the CWP and its surroundings could endanger the safety of the tap water. The control of the waterquality at the source is of utmost importance.

4.2.1 Analysis data

- Scheme level

The supplied water in Mzuzu is treated river water (annex 11). Since December 1992 the WD has a laboratory chemist without laboratory. He has the equipment for bacteriological testing of the water. On the 8th of June he tested the tapwater of two CWP's. It was the first time for him to do that. The outcome: no chlorine but also no bacteriological pollution (table 1).

A chemical indicator is used to see if there was chlorine present in the tap-water. The water sample is pressed through a filter by a vacuum pump. This filter was investigated under the microscope to calculate the amount of bacteria remain on the filter. Faecal Coliform (FC) bacteria indicates that there is human faecal contamination and that this contamination is recent.

Table 1 Results of tap water samples by lab chemist of WD in June '93

CWP	CL mg/l	FC col/100ml	FS col/100ml
8	0.1	0	0
24	0.0	0	0
32	0.0	0	0
37	0.1	0	0
56	< 0.1	0	0
62	< 0.1	0	0

Feacal Streptocol (FS) indicates that there is animal contamination and this may not be recent. FC contamination is worse. Although the tapwater was not polluted it is still dangerous that there is too little chlorine in the water. Bacteria in the bucket can easily pollute the drawn water. Even when a child is drinking from the tap the water can become contaminated. Then diseases like diarrhea can easily break out (source: lab chemist). Drinking clean water will cure people faster from illness than drinking contaminated water when the body also has to fight against the bacteria. We checked at the treatment plant in the logbook. The chlorine concentration was already too low at the plant, which occurs frequently. At the treatment-works the concentration of the chlorine before distribution needs to be 3.0 mg/l, at the taps before consuming it must be 0.2mg/l (source: lab chemist). It appears that there is too much organic matter in the water and while reaching the tap the chlorine has reacted.

The consumers of the CWP's like the taste of the water (75%). The majority of the consumers does not give their opinion upon the safety of the tapwater (70% gives no answer) when it is asked directly. Still 49% of the consumers are boiling the tapwater. This percentage is not acceptable because firewood is expensive. A remark of one of the women on the questionnaire:

"I boil the water, the reason is it is not safe. When the water is boiled I find a lot of dust and there is no sign of soda these days".

It is reasonable that people boil their water if you take into consideration that the water is not always treated well. But that it is something the people do not know. The most common way of storing the water is just in the bucket itself, but only 58% is cleaning the bucket every time when they fill it and 25% once a day only. The lab chemist speaks:

"When there is chlorine at the tap it also kills the bacteria which are in the bucket"

The people do not wash clothes, dishes or children at the standpost (83%). They know that when the CWP is dirty it causes diseases (75%). That is the main reason why they keep the CWP clean. "Keeping clean" means for them sweeping the CWP and its surrounding but only the dry places, which is done

daily. They do nothing about the wet puddles around the CWP. These puddles occur from leakage or rains. When this water gets contaminated the children playing around the puddles can become ill and can spread diseases. Most of the CWP's do not have a soak away pit. This results also in a wet surrounding of the CWP. Some CWP communities made by own initiative a soak away pit but these are not functioning. An other cause of wet surrounding is the leaking of the gatevalve in the meterchamber. 80% thinks that the CWP is clean. Another possibility is that the question is interpreted wrongly and the opinion is given about the cleanliness of the tapwater.

The majority (61%) of the community is of the opinion that water from alternative sources is causing diseases. The main reason why they sometimes still use these sources is not because they do not trust the tapwater but because of breakdown of the CWP. Children are playing at the dambo (swamp) sometimes the whole day without coming home so they just drink from the streams. (annex 4).

- CWP level

"This is the worst we ever saw. The whole standing area is filled up with water, you easily can see the germs swimming in the pole (fieldvisit CWP 14, 4th May '93)"

You see children drinking from the tap with their mouth covering the tap. We selected CWP 37 because the performance was very good at our fieldvisit, a well maintained standing area filled with little stones and without sand. During our second visit, the meeting for the inquiry, we were told by a Health Officer who was joining us that places in between banana plants are used as a toilet. CWP 37 had less than 3 metre away from the structure such banana plants. CWP 6 and 34 had a very bad performance, the area around the structure was wet, the drain was broken.

At CWP 37 the majority is sure that the tapwater is not causing diseases while CWP 6 and CWP 34 do not give convincing answers.

Almost everybody of CWP 37 has the opinion that their CWP is clean. At CWP 6 and CWP 34 it is two third.

There is not much difference in answer between the "good" one and the "bad" ones.

4.2.2 Conclusions

The awareness of the waterquality is there because people know when the CWP is dirty that it is causing diseases. Only that signs of giving evidence of this awareness are hard to discover. Not everyone cleans the bucket every time before filling and still some people boil the water.

There is not much difference in awareness and handle of between the community of "good" and "bad" performed CWP's.

Storing your water in the same bucket used for collection is not the best way to keep your water clean. This is not a matter of being unaware of the quality of

the water but could be lack of means.

The water is treated at treatmentworks, but there is almost no sign of chlorine at the tap. However, the tapwater is not poluted bacteriological,

4.3 RELIABILITY OF WATER SUPPLY

- **Hypothesis:** The water supply has to provide water all the time, throughout the year.

The reliability depends on the frequency of breakdowns of the distribution system and the CWP construction. The community exceptance of these breakdowns depends on the availability of other sources. It will influence their opinion on the CWP.

4.3.1 Analysis data

- **Scheme level**

On a bulletin board in the office of the Chief Water Supervisor is a handwritten note:

"Notice' water shortage, the city of Mzuzu is also hit by the drought. Water Supply will be closed at 8.00 pm and be opened at 5.00 am from today untill further notice. Sorry for the inconvenience caused. For RCW (n) 11/11/92"

The whole of Malawi suffered from this drought. That time there was a water shortage for the whole of Mzuzu. What about the community of the CWP's in the city, do they still suffer from water shortage?

People do not get water through their tap all the time. Reasons are electricity shortage or pressure problems. It happens that the city is without electricity, because of repairs at the lines. Most times this happens on Sunday, but not every week and if there is no electricity the pumps at treatment works do not work and can not supply the tanks. So we asked the Chief Water Supervisor in an interview about the water supply for the city in case there is no electricity. It takes 4 hours for the tanks to empty if they are not refilled (annex 12).

At the question, when was the last time that there was no water at the CWP, 22% of the people answered less than one week ago. 23% could not remember, but there is a large difference among the CWP's questioned. At the question, do you know exactly what went wrong when there was no water, 45% answered with lack of pressure, 22% did not know and 20% said because of repairs at the main line. 55% said it took the whole day to repair it. At the moment the city's water supply will be extended, new pipe lines and a dam are under construction. The figures mentioned above may give misinterpretation of the actual situation because some of the CWP's are having the problem of water shortage every day. A Water Foreman said:

"If we are going to install a new connection, CWP or individual connection, we look how many connections already are on that line. If there already are to many the people have to wait untill we have upgraded the line."

If we ask the reason why they do not have any water on the line with CWP 16,21,22,23,24 and 58 the MA says because there are too many individual connections.

- CWP level

At CWP 24 they wrote on the questionnaire:

"Sometimes the water does not come out, sometimes we come back without drawing water and we do not find water."

If they do not draw water from the tap they have to go for alternative sources (annex 8), which in most cases are not very reliable. Streams and self dug wells are sources for diseases. It is remarkable that people do not lose their confidence in the CWP. At CWP 24 they still come to draw water from the tap and continue to pay for it. At CWP 32, where people only get a little water, they even constructed their own drain with self raised money.

4.3.2 Conclusions

Most of the CWP's do not have water shortage and water is coming from the tap most of the time. The pumps at treatment works are working on electricity. Because electricity failures do not happen often water is coming from the taps most of the time.

But there are a lot of people of the CWP's who can not draw tapwater through out or even each day. This is due to too many individual connections on a water line, which is causing pressure problems. But still they keep using the tap.

4.4 CONVENIENCE OF THE WATERPOINT

- **Hypothesis:** The appearance of the water point has to be accessible and attainable; it should not be more than 250m from the house of the consumers and not more than 30-40 households per CWP (Ref.10). The appearance should be the same like it was constructed.

If the CWP is too far people intend to change water source and may use rivers or unprotected shallow wells, which are not safe. The same you can apply on the amount of consumers, the people will have to wait too long to fill a bucket if the consumers group is too big. Therefore it is important to know why people are using alternative sources. The construction of the CWP has to be made in the way the people can easily draw water. Stumbling to the source by broken standing area or platform is not very inviting. If the construction does not operate for example by broken or missing taps it can be more convenient to get your water elsewhere.

4.4.1 Analysis data

- Scheme level

The CWP structure is designed in October 1983 by the WD and was amended in February 1985 (annex 13 & 14). If you look at the implementation it is not always according to the design, especially the drain which has not any foundation.

What do the users think of the CWP construction? The opinions are very differed.

"If you mean the shade than it is alright; I want the condition to be changed so it is easier to put the pail on my head".

The reasons the users give for changing part is because of danger, not functioning of the part or the part is uneasy.

This is our opinion:

(for the names of the units see fig 1)

- the majority the platforms of the CWP's has holes filled up with water. There are different widths of the platform. The big ones become dirty more quickly because it is easy to stand on it.
 - the standing area must be used as a place where the bucket can stand on while waiting. It has to be filled up with small stones so that water easily can infiltrate. We were wondering if the small stones on the standing area were painful for the feet of the women but they denied it. Most of the standing area (80%) are filled up with sand, full or half full. Only 4 of the 62 CWP's have perfect standing areas. We noticed in the field that the people do not often use the standing area. They just stand next to the platform while filling the bucket because the standing area is used for parking the buckets.
 - the drain is the biggest problem. At two third of the CWP's the drain is broken. Two CWP's even do not have any. When the drain is not working the surrounding of the CWP's is completely wet. There are only three CWP which has a soak away pit and a complete drain.
 - the copper taps are not always working. During our field visit, 12 of the 62 CWP's had broken taps.
- Some CWP have three connection possibilities but at most of the CWP's only the two at the exterior are fixed because people felt squeezed using the one in the middle.
- the pillar is very solid. None of the pillars were showing problems. The pillar is sometimes used as an appliance for putting the bucket on the head. It appears that the women leave the full bucket on top of the pillar which is very dangerous when children are playing around the CWP.
 - the meter chamber is covered by a plate of steel which is locked with a padlock. In the meter chamber we find the main tap for closing and opening the CWP. When it is locked people try to jerk the cover.

The bended cover is dangerous for children, hands can come in between or they can fall down on it. Inside the meterchamber there is the water - meter (KENT), stopcock and gatevalve. 10 stopcocks are leaking. The design of the meterchamber is not good. It is very hard to work with tools inside. There are no stopcocks in the office, so the stopcock in the field are repaired with plastic bags.

Breakdowns of the CWP occur frequently. In 76% of the cases it happens every three months and even in 30% of the cases weekly. The cause of breakdowns can be a tap breakdown, breakdown in the meterchamber (gatevalve) or stolen parts. Afterwards the questions concerning this issue, nr. 23, 24, and 25 (annex 4) were put wrongly, unfortunately. We meant on the breakdown of the parts which could decrease the convenience. We should have asked more about the parts broken.

The maintenance of the CWP is the responsibility of the users. The supply pipeline upto the meterchamber is under the responsibility of the WD. WD is willing to assist people by supplying labour when something has to be repaired but the material need to be brought by the users.

"Do you contribute anything towards the maintenance of the CWP like cleaning or repairing" was one of the questions. This question is answered differed. We already discussed that most of the people are "cleaning" in paragraph 4.2. We assume that the question is asked especially concerning the repairing.

The average distance from the waterpoint to the houses of the consumers, which is calculate from the answers of the questionnaires, is not very reliable. Quiet a lot people were answering the question with "1 metre".

"This is two metres. The monitoring assistant explains it to the people while showing the width of the pillar".

Even the minutes which were filled at the question how long it takes to go to the CWP. There was confusion about this question. Some people interpreted the question as the time it would take to fill a bucket. What can be said is that the distances from the houses, in the area for which the tappoint is destined, to the CWP is for most people less than 500m. This data is obtained by observation of the CWP's.

Ideally, the CWP should be located in the most densely populated section of the community but in a place central enough for short walking distance for everybody (e.g. at most 500 metres) (Ref.8)

For the 30-40 families were the CWP was planned for the distance is less than 250m (source: MA).

Although there are CWP's at the boundaries of area's where people come from along the distance, 2 or 3 km because there is no tappoint in their area. These CWP's are overcrowded, more than 100 households are using only one CWP. The average is 56 consumers per CWP. Only 21 CWP's have less than 40 households and 23 CWP's have more than 56 households.

Why is the community still using alternative sources? The main reason for doing that is when there is a breakdown of the CWP and not because it is cheaper, or more tasty.

The distance from their house to the alternative sources plays an important role for the decision to use it. Calculating the average distance was as unreliable as the distance from the CWP to their houses. It is hard for us to discover the alternative sources. The Well Technician told us that there were only two protected shallow well pumps installed in the city. From a Health Officer we heard of an other two shallow wells. The MR knew more places of self-dugged swallow wells but unfortunately we only visited one together with him. It is possible that people were leaving the CWP because of inconvenience but that was hard to check in the time available.

- CWP level

Drawing water from a CWP is only possible during opening hours. In the past drawing water was possible throughout the day but in order to control the water use the committee had to establish opening hours.

You would expect that users of overcrowded CWP's complain about the row of waiting people at the CWP or the limited opening hours.

If we look at the answers of CWP 32, which is located at the boundary of Zolozolo, two third has no complains about the openings hours. This can be explained. Only 47 of the 120 users of CWP 32 were present at the meeting. We expect that those people will live near the CWP and do not have problem with collecting water within the openings hours. It is a pity that we could not interview the people living far from the CWP.

Some remarks written on the questionnaire:

"They close the CWP before I get there;They close the water system quickly"

There are complains about the opening hours. The MA told us their limited opening hours is on purpose, the users do not want more people joining the CWP. That is very bad. One of responsibilities of the committee is to accept new members (annex 15).

To avoid getting too many people at the tap, CWP 32 has shorten the opening hours. Their opinion is that these people living further away have to go to WD to request for their own CWP. It is remarkable, although the figures are not very reliable, that both alternative sources and tappoint for CWP 32 users are the most far away compared to the other 6 CWP's.

An other reason why opening hours are limited is that bills will rise and children will play with water.

For CWP 32 the question about contribution towards maintenance is answered uniformly with "Yes". At that CWP the community has constructed a new drain on their own initiative. Even at CWP 37 the people filled it in positive (62%). Their standingarea is well maintained.

CWP 56 does not have a good performance although 61% has answered positively. With erosion around the CWP the foundation can be seen. The structure becomes very vulnerable and difficult to access.

Since the operation of the CWP's three of the seven selected CWP's had problems with the bibtaps (assumed that the people buy their taps through WD and deduced the price from their credit balance from which we collected this data). CWP 6 bought 6 taps, CWP 32 3 taps and CWP 24 7 taps. Why only these three and not the others?

CWP 32 is located at the border of the area on a hill. It is a bit isolated. It is not so surprising that theft occurs here frequently. CWP 24 has serious pressure problems and very often air pressure is coming through the taps. The reason for the problems with the bibtaps at CWP 6 is difficult to understand. Still it is possible that the other 4 CWP's also have problems with the taps frequently. Instead of buying the taps at WD they can buy them at the market cheaper. If they do not buy a new tap they stop the water running by closing the stopcock. This is one of the reasons why stopcocks often get broken. Like CWP 34 has broken taps at the moment but also a big debit balance since August '92, so there is no money to buy a new one.

One CWP (nr 47) protected their taps with a steel lock to prevent against theft and three CWP's turn off the taps at night and take them home.

CWP 62 was a kiosk before. The construction of a kiosk is different from the CWP construction. There is no standing area with small stones but a concrete floor and the construction is covered with an iron sheet roof. Though the things they like to change at their now called CWP is not much different from the other CWP's except for the cover and lock of the meter chamber which are missing.

4.4.2 Conclusions

There are a lot of inconvenient aspects about the CWP: too many people at the CWP gives long waiting hours, too short opening hours, taps get broken frequently. Most of the structure are not how they are supposed to be. In most cases there are no soak away pits or drains, standing areas are broken or not filled with little stones. However all these defects do not prevent the people in drawing water from the tap. The defects do not disturb the people in that way that they choose for an other water source.

There are too many people at the CWP to be convenient. (It would have been good to ask the people how long it would take before they have filled all the buckets).

4.5 PROPORTION OF HOUSEHOLD USING THE FACILITY

- **Hypothesis:** The water offered via the CWP should be used by everybody in the community.

The tap water is meant for everybody in the household in the community. If someone in the community is not using the tap water but an alternative water source they can easily contaminate the tap water and bring an epidemic disease in the community, like cholera or diarrhoea. It is necessary to avoid such tragic.

4.5.1 Analysis data

- Scheme level

People are free to take in the "community" of CWP-users. They can at any time decided to go for an alternative.

The CWP's give low income households the possibility to use treated water. When people do not utilize this possibility there must be reason for that. They may feel it is not save, too expensive, too far away from their house or are excluded from a community. The large amount of households (to get a proper opinion about their use of the alternative source) which are not using the CWP, are difficult to reach. If we count the amount of people using CWP's and people using individual connections it is 36,000. According to the last population figure the population of Mzuzu is 65,000. So still 30,000 people or 5,000 households are not using the water from the piped system. It is plausible that they are drawing water from alternative sources. However, it could be that a large proportion of these people are buying their water from an individual connection (annex 8).

On the question, which household members are using the water of the CWP for drinking and personal washing, they answered mother 83%, father 47% and children 44%. However if everybody use this water, it should have been three times 100%. A certain percentage of the people could have thought that they only may fill in one answer and because most of the interrogated people were women they just ticked mother. A peace corps volunteer working for CC speaks:

"Children are playing at the dambo sometimes the whole day without coming home so most of them just drink the water from the stream."

This means children are not using the facility as much as the adults, although they do not play every day at the dambo.

- CWP level

For this CWP no particular CWP was selected. It is difficult to see in advance the difference between the CWP's for what proportion of household is using the water from the CWP.

If we look at CWP 24 we see that the utilisation of the tap water is at closest

to situation in which everybody is using the facility, in spite of the water shortage. It must be that the assisting persons at the questionnaire explained the question better at this CWP, maybe just somebody asked for it.

4.5.2 Conclusions

It can be concluded that all family members are using the facility. It may be too expensive, too far away, not tasteful to them, or not convenient for the 45% of the population of the city of Mzuzu who are not taking water from the piped system. Further investigations has to be done to find where these people are taking water from and why they are not using the tap water.

4.6 VOLUME OF WATER USE AND FOR WHAT PURPOSE

- **Hypothesis:** The water from the CWP should be used for all water needs as drinking & cooking, washing of food and utensils, personal washing and washing of clothes.

If people can not draw all the water they need from the CWP, they fall back on alternative sources or using a source which is more expensive and difficult to afford. People at a CWP may use different water sources for different purposes.

4.6.1 Analysis data

- Scheme level

The questionnaire assimilated one question to test if the CWP community on its use of tapwater. It was asking the amount of the tapwater for different purposes per day.

A man is filling in that he collects 5 buckets a day. If we calculate the total amount used for the different purposes it is 8 buckets a day. We ask the man again how many buckets he is collecting a day. He answer is 5. Then we look together with him to the buckets filled in for the different purposes, 2 + 3 + 3. "So you collect 8 buckets a day". "No, 5 buckets."

What can be said that not all purposes are done daily, for example like watering the garden or washing. Especially making bricks in an activity done from August to December when it is dry season and the bricks can dry in the sun.

If we look at the results the most important purposes were the tapwater is used for is drinking & cooking, washing of food & utensils, washing of clothes and personal washing. Although washing of clothes was only filled in by 70%. You can conclude that the other part of the community is washing the clothes in the stream. What also can be possible that the people were interpreted the question wrongly and were just filling in the buckets for tapwater as well as stream or shallow well water.

The MA is not stimulating the people using the tap water for making bricks, but it is not forbidden.

Water is not often used for the purposes of watering animals, making bricks and watering of the garden (respectively 32%, 17% and 18%). However, there are people who are not a member of the community, but use the water for making bricks. In that case they pay the committee for the water. An other activity where tap water is used for, but not put in the questionnaire is brewing beer which looks like porridge made of maize. Some of the women try to gain some extra money with that.

- CWP level

There is not much difference in amount of bucket of the different purposes between the CWP's. Remarkable is that CWP 24 has the highest percentage of not answering all purposes. This can be due to pressure problems.

4.6.2 Conclusions

What can be concluded is that tapwater is used for all purposes, especially for the most important ones (drinking & cooking, washing of food and utensils and personal washing). If we count the amount of buckets for these purposes including washing of clothes, the total amount of water used is 33 litre per capita per day (10 buckets) which is not corresponding to the figures established before. It is more complicated for the people to specify the amount of buckets used for the different purposes than to calculate the total amount of buckets collected each day. For this reason the figure of 17 litres per capita per day (calculated from the answers) is more reliable.

It is not good that people who are not member of the CWP community use the tapwater for making bricks because the CWP water is cheap. The water could be better used by new people joining the community. However being a member and using the tapwater also for commercial purposes like brewing beer is just an other way of earning some money.

4.7 ORGANISATION

- **Hypothesis:** The organisations concerning operation and maintenance of the CWP should comply with the responsibility guidelines.

A good organisation is the key to a well maintained and good operating CWP. A tap committee plays a leading role in the operation of the tap. They have to take care that the community is paying for the facility, keeping the CWP clean and maintaining it when ever it is necessary. The WD should monitor these activities and educate the community whenever anything is going wrong. If the organisation is failing in any of this, the CWP can be non operatable. Failing in maintaining the CWP could mean the structure is collapsing or dangerous for health if water is stagnating at the tap site.

4.7.1 Analysis data

- Scheme level

There are different organisation levels that have influences on the operation and maintenance of the CWP. First of all there is the WD which has built the construction and provide the water. The WD has a MA which has different responsibilities concerning the CWP's. The MA works under the section O&M urban of the WD. His boss is a Water Foreman who is responsible to a Chief Water Supervisor for O&M Urban. The sections of WD are: Rural, Urban, Ground Water, Hydrology and Water Lab. The WD of the Northern Region is under Ministry of Works for the Northern Region, but this only concerns management. Technical supervision comes from WD headquarters Tikwere Building in Lilongwe (annex 16).

There is an other organisation level called the District Development Centre, presided by the District Commissioner which has to control the social aspects of the Communities. It is based in Mzimba and does not concern with the CWP's in Mzuzu. There is special District Commissioner for the city Mzuzu, but he does not see the CWP's as his responsibility. A level lower we have the WCs, they are under CC and control different areas. When ever there are troubles in the area people can go to him and discuss the problem. The only WC who showed really interest in the CWP's is the one of Chibavi. The problem is that it is difficult to get hold of a list of responsibilities of the organisations mentioned above. There is a trend that civil servants are transferred after a period of time to an other location. With a transfer a lot of information get lost because no everything is written down. There is almost no communication between WD and the communities of the CWP's.

There is still the influence of the Malawi Congress Party (MCP), they can force people to pay or elect a new committee. A Community Development Officer said the reason they pay for the water is not because they are afraid of MCP. In Masasa there is a different situation. This area grew from a village and is now within the city boundaries. There is a village headman, but his power is low concerning the water.

It is the job of the women to take care of the water, but when an area gets densely populated the water becomes scarces and difficult to keep clean. What we discovered in daily live of the Malawians that there is a strong "social class" structure. When the MA is sitting together with the Project Manager he is too shy to talk. The same MA poses as a leader when there is a meeting at a CWP and women are sometimes even kneeling for him. In an interview we asked the MA: Does all CWP in the northern region have a monitoring assistant?

All the CWP in the northern region are under mine supervision. Every station there is a plant operator who is reading the meters. They have control sheets there. When I go there I just go to see the control sheets. Every problem of a CWP is recorded by them. It is very hard for me. They give me only two days. Maybe I only can see one CWP and come back.

His responsibility list is maybe too big as supervision over MRs, financial record keeper for all the CWP's in the northern region except for Rumphu and MA for the O&M of all these CWP's. Maybe because of time and no transport he can not fulfil this last responsibility properly. But you see him play "bowa" under working hours it can not be lack of time. It may be African culture for him. To us it looked like he had no transport to do his work (in the friendly way) or just lack of interest (in the critical way; some CWP's are not that far to walk)

The MA speaks:

"I am Monitoring Assistant officially in 1986. But I was monitoring before. From July 1984 I was helping a friend who was an accounts assistant."

Officially he is a meter reader, he has no qualification of a monitoring assistant. He has attended three workshops. One was from 19/1 to 24/1 1992 at Luchenza, organised by PSSC. In 1986 there was one in Salima together with the Project Manager and the Chief Water Supervisor of the Northern Region and one in Zomba in 1985.

The CWP's are wide spread and he has to walk to each one of them since there is no vehicle provided for him. This takes a lot of time. Under the MA there is a MR for the CWP's. He supposed to read the meters every month. The MA says the MR is not doing his job, but does not want to report it to his boss.

"It is very bad you know, to talk about somebody like that, I am not used to do that?"

The MR is writing all the meters read in a black book he takes with him when he goes in the field. We had the opportunity to look in his book and saw a lot of the meters of the month before not yet read. We found out that the same MR is also allowed to write on the ledger card. So it could be he did not visit some of the CWP's for quite a long time. He was telling us that when something is wrong with a certain CWP, community or structure problems, he reports it to the MA.

At CWP level we have the tap committees with a Chairman and vice, Secretary and vice, Treasure and Committee Members as organisation structure (annex 15).

A committee has to change every year, otherwise it becomes too powerful (source: MA). It is chosen in a democratic way by raising hands (annex 22). The reason why there are so many women in the committees is that they are afraid to abuse the money. Men proved in the past that they use the money for their own investments.

We asked the people how long they are living in the house they are in now. From this you can conclude if they stay for a long time on the same place which may stimulate the community feeling.

31% of the people questioned lives in their house they are in now for 6 years or longer. 20% lives there 3-5 years and 27% lives there one year or shorter. The people who have relatives at the same CWP-community is only 39%. What happens when children get married? In the Tumbuka culture they move to their husbands home. This could be that he is living on the corner. This is hard to

check. A Community Development Officer speaks:

"In town people feel related, but in an other way they are in the villages. In the villages people are related through blood(family). In towns the people get related by living together and through funerals."

To see if the Community seeks contact with WD in case of a breakdown and to see if their is communication we asked a question about that.

They all fully agreed on the question, if they report the breakdown to the WD, 77% answered yes. At the same question but in an other form only 44% answered with yes (the construction of the question may have been to difficult, because 48% did not answer).

55% of the participants said that it took a few hours or even the whole day to restore it. The reparations were done by the WD according to 55% of the participants. 59% thinks that the WD told them that they have to pay for the water from the CWP. Communication between WD and Community has taken place. When somebody is not paying, she is not allowed to draw water according 78 % of the people. If they all agree with this and they want to be sure that nobody is drawing water without paying there must be a strong social control.

"A woman at the age of 75 years, you can not allow her to pay for the water. These people are not calculated on the list of payment, but are also consuming the tapwater", a Community Development Officer speaks.

During the field visits we saw a lot of meters not running. Some of them are not running for more than half a year. We have no 3/4" meters in stock the Water Foreman says only 1/2" meters for individual connections. Negligence in ordering or this not where the money is?

- CWP level

At CWP 6 in Chibavi, chosen for this indicator, we wanted to test the influence of the WC. This WC showed a great interest in the CWP's, he was present at both meetings at CWP 12 and 4 for the educational talk on responsibilities of the community and committee. He himself was supervisor during the election of the new committees, which normally should be done by the MA, without attendance of the MA. All the questions concerning his influence they showed no difference with other CWP's. In fact the WC was never mentioned. He was not present at the day of the inquiry. It looked like he has a lot of power, but it can not be seen at the appearance of the CWP and surroundings. What is striking is that none of the CWP in Chibavi have a debit balance. People who know him say he is a good politician.

CWP 32 and 37, where they showed a lot of own initiative, have nearly only man in the committee. They pay regularly, but do not have a very high credit balance. At CWP 32 they had a committee of only women. These women falled out and quarrelled. After that only men were elected in the committee.

At CWP 37 it was the committee with 43% who was repairing the breakdown and 38% said it was the WD.

4.7.2 Conclusions

The MA is not visiting the CWP's very regularly. Lack of transport is an important factor. Within the organisation of the WD the inferior respects his superior. There is not a lot of space for discussion. The tap committees however are chosen democratically. In most cases the community is thinking the committee is doing the job they suppose to do. The WC in Chibavi is not as powerful as seemed with exception of the credit balance all the CWP's have in this area, but his influence for this could not be proven.

The concern for the CWP's is limited to the M.A. and M.R.. However their role in the well-being of the CWP's is not as high as it is supposed to be.

It can be concluded that on committee level the men have higher input in maintaining the structure.

4.8 PAYMENT

- **Hypothesis:** The payment of the community should correspond to the amount of water taken from the waterpoint; the balance of payment should be a credit or break-even.

What can be said of people who are prepared and able to pay for the treated water? Nobody would buy water, if they have opportunity to draw it from a river for free!

4.8.1 Analysis data

In the city the people think of money, but in the rural areas they do not. The people do not save money in any form. Our garden is the bank. We pay already a kind of tax at places like the market or when you are cutting wood in the forest.(source: our cook and watchman)

- Scheme level

The average income of a household in the CWP area's is around MK 110. = per month, although there is quiet a big difference between the different area's (MK 1. = : US\$ 0.23; June '93).

It is often stated that the upper limit of what a household can afford to spend on water is about eight percent of their cash income. (WHO Ref.6)

A household, existing of 6 people, will need 90kg of maize flour (staple food) per month which costs around MK 58. =. It is not surprising that a lot of people have or need a small garden around the area they live in. This assumption of the WHO is not acceptable for this situation. What a household pays per month is MK 2. =, which is 2% of the average income, vary from 1.1% to 2.9%.

In May-June 1992 the contribution of the households increased from MK 1. = to MK 2. =. The reason for this was the increasing water tariff from MK 0.29/m³ to MK 0.46/m³. The tariff became 1.5 times higher while the contribu-

tion was twice as much (annex 18).

If a household is taken water for private connections they have to pay around MK 5. = or MK 6. = per month or 15 tambala per bucket (5 bucket per day makes MK 22.5 per month).

With real costs of water supply at MK 1.16 ('91/'92) CWP tariffs of MK 0.46 are set at a highly subsidised rate. This reflects the policy of the DWSF which was also stressed by high level staff of the WD: standposts are a social service (Ref.7).

Only half of the people will continue to draw water from the tappoint when the price is increasing again.

How does the financial side of the CWP's looks like:

once every month the MR is going into the field to read the meters. He starts at the 10th of the month till he is through. In the office he writes down the score on the ledger card. This ledger card keeps all the financial records right from the initial payment of each CWP. He also fills in a Remittance Advice Form, which is the actual bill (annex 19).

The cashier is comparative close to the CWP. Not like in Chirumba were they have to go to Karonga for paying the money which costs MK 8. = for the bus.

One or two of the committee members come with the "household contribution" form to the office (annex 20). (This form is filled in by the Secretary. The Chairman is supposed to be there while paying the money and filling in the form. The Treasurer keeps the paid money). Here they get the bill for that particular month and with the bill and form they go to the Cashier and pay the amount of money collected for that month. The amount of this money should be every month the same because every family of that CWP should pay MK 2. = every month to the Treasurer. Then they go back to the office where the MA registers the transactions. Most of the time they pay more than the amount of the bill. The office keeps the surplus money so that in case they want to change a broken tap for a new one the office can reduce their surplus money with the costs of that tap. Or in case they do not pay the next month, the office will reduce the surplus with that particular bill of the next month. From the office in Mzuzu the money goes to DSWF in Lilongwe (annex 21). Then there is also a Ledger Card. It keeps all the financial records right from the beginning of each CWP.

After paying at the cashier the committee member comes to my office with the receipt. I write the amount in the General Receipt (GR) book. At the moment I am using this book. I started it in 1990. The first GR book is missing. I found it wise to have such a book so when I am off my colleagues can easily fill in that book and then they don't have to enter the ledger card (source:MA).

Sometimes the consumers are paying but the Chairman does not pay all the money to the office. Then they can check on this "household contribution" form (annex 20).

For every three months the MA makes a summary of the financial records of all CWP's and sends this to the headquarters where it goes to the Project Manager.

While we are in the office of the MRs, two women are coming in. They wanted to check how much their payment balance is. CWP 50 is in debit balance. The monitoring assistant refuses to give the figure because he saw that they were carrying the list of payments of the members. If he would say the debit they would just pay that amount to the cashier and keep the rest of the money from the CWP members and share it which is very bad but clever!

Small families subsidize the larger families in line with the African extended family system. Viewed in this light, demanding that bigger families should be paying more is like penalising them for having many children which is not in line with the Malawian cultural way of living. What do the consumers think about this? Only a small percentage says that it is not good that every member pays the same amount for the water.

"It is not good that a bachelor has to pay the same amount of money", one of the remarks written down on the questionnaire.

But when you ask them if it is fair to pay for the water the opinions are divided. From the people who said "no" the main reason for that is that it must be a social service.

One of the task of the MA is to tell the people, when they ask him why they have to pay for the water, the following:

The government pledged to contribute the infrastructure extending the pipeline to the areas and constructing the Water Points at no cost to anyone. To balance this input, the communities pledged to contribute management of the Water Points, running the CWP's and looking after the surrounding. Second input by the Government is the continuous supply of fully treated water to the Water Points on a daily basis. This costs a lot of money and is also not fully charged to the Water Point Consumers (Ref.4).

That the water is treated and that it is not causing diseases is the main reason why the other people were filling is that it is fair to pay for the water.

A Community member says: "Of course, who else have to pay if a new pipe has to be fit or repaired and how should you do that?"

54% of the people are still able to be a consumer of the CWP when the price per month is increasing, 33% is not able. During the visit of the shallow wells we met a woman who was using a shallow well before but now using a CWP because of contamination of the well. We asked her if paying MK 2. = per month is not too much she answers:

"I can not say MK 2. = is too much, because they told me to pay"

What happens is that when consumers are not paying, the Chairman can go to the area Chairman of the MCP who can force people to pay. The MCP was up

till now very powerful and could frighten people. This is going to change now the referendum of June 1993 showed the victory of multiparty system. A Community Development Officer speaks:

"Through the MCP people they are forced to pay the bill but that is not the reason why people are paying for the water."

When a CWP is not paying and the debit balance becomes very high, the MA threatens with disconnection of the CWP. The WD has to ask for permission from Headquarters to disconnect a CWP.

"What we facing here is that we are not advice to disconnect the CWP's. Politically seen, we try to help these people. What we do is approach them and asked them to pay the bill. There is never a CWP disconnected because of a debit balance. This answer was given by the Chief Water Supervisor during an interview.

But the people do not know that they actually can not be disconnected and become afraid when the WD threaten with it (annex 22).

At CWP's with a high credit balance members do not misuse the money or at least it does not seems to be that way. This does not conclude that CWP's with a low credit balance or debit balance misuse the money. It could be that they do not pay regularly or not all consumers pay every month. It is hard to discover if committee members misuse the money when they do not bring the "household contribution" form and when the community does not check the form. People in the city are used to pay for house rent and food. This fact plays an important role in the reason why they pay for the water.

- CWP level

The "household contribution" form gives important information about payments of the users.

After the "household contribution" forms are filled in for four months, they are hand in at the office. The committee member get a new from for the next four months. The full ones are kept in the office. If the forms are not eaten by mice than the meter readers know what to do with it. They do not see the value of these forms and use it as toilet paper (source: MA).

In this way a lot of important information disappears. There is no possibility for the MA to protect these important files.

When we asked the MA the household payment list of CWP 6 he told that it is not in the office. When a committee member of CWP 6 came to pay for June he discovered that the Payment of the months before was not written down on the ledgercard. He explained what happen: "We have given the form and the money to the MR to pay for us. It was for March and June". The meter reader has never given the money to the office. Now a days the meter reader is not reporting anymore.

CWP 56 And CWP 34 have a high debit balance, while CWP 32 and CWP 62 have a high credit balance. CWP 37 is an example of steadiness (annex 9,10). CWP 32 has a lot of consumers as mentioned before. One of the reasons for this is that consumers of CWP 31 shifted to CWP 32 because CWP 32 had a high credit balance. That is what happens. The consumption is decreasing the last years because of decreased water supplied (pressure problems), while their payment increased. Remarkable is that the Treasurer goes to the houses of the consumers to collect the money, at least that is what he said in the questionnaire. 120 houses every month, that is a lot of work and he has a real job also. CWP 62 started just recently, in August 1992. It was a kiosk before were people had to pay for every bucket drawn. One of the reason why the kiosks are closed now a days is that they were not financial profitable anymore. There were to many wastages and MK 0.01 per bucket was not sufficient. CWP 62 has a very high credit balance. Because the people were use to paid frequently (6 buckets a day of MK 0.01 is also around MK 2. =).

CWP 34 has quarrels in the committee mid 1992, that is why they did not pay every month. In 1986 this CWP had a very strange way of payment. The Treasurer came in December to pay for the last 5 months, while the households paid him every separate month. This is not the right way, because the money can easily be misused. It is hard to check for the MA

CWP 56 started May 1992 with creating a debit balance and till now it is still getting bigger. Their consumption per month went up. Right from the beginning up till now the balance of CWP 37 is always around the zero. The last two year their payment is very constant, almost every month they are paying. The months they do not pay are months with a credit. It looks like they can control their financial balance. The last months they had a constant low debit balance, to get rid of this they paid in the month of march MK 4. = per household in stead of MK 2. = .

It is also remarkable that committee members in general find it not fair to pay for the water because they are of the opinion that water supply must be a social service. How can they still motivate people to pay? But most committee members will still continue when the price per month is increasing. But there is no choice when you want to drink treated water.

CWP 62 pays frequently and has a high debit balance maybe they were used to pay for the water.

4.8.2 Conclusions

In general you can say the committee is collecting the money and bringing it to the office each month. However, it happens that committee members with hold the contributed money, but this does not happen on large scale. The price MK 2. = a month is not too much although their wages are not that high. It may be due city life, people are used to pay for services and know the consequent when they do not pay.

It is fair to pay for the water because it is not causing diseases, most of the people answered on the inquiry. Because the Cashier's office is in the city itself it does not take too much difficulties to pay. The registration of the payments is excellent. It is easy to see if a CWP has a credit or debit balance and how many months they did not pay.

4.9 EDUCATION

- **Hypothesis:** If an educational message is well understood and brought in practice the operation and maintenance of the CWP should be in good condition.

Education is an important factor. You just do not pay for the CWP or maintain it if only somebody said so. There must be awareness in the community to ensure continuity of the system.

4.9.1 Analysis data

- Scheme level

Before the CWP's were constructed an agreement form was signed by the community present on that date. This form however, was in english with a lot of technical terms and therefore not understood by the people. At the time of the implementation of the system there was an educational talk about the CWP and the guidelines for the committee and community were told (annex 15). With the election of a new committee there should also be an educational talk about responsibilities and operation and maintenance of the CWP. New committees are not always selected by the MA, but sometimes by the WC or the MCP chairman of the area. An other form of education is given by Health Department (CC) and done by a house to house survey. This survey does not concern CWP's, but deals with sanitation problems like pitlatrines, drainage of dish racks and rainwater from roofs and health of household members. We skipped a question, after the pilot testing, about education. The people were asked if they had any type of educational talk at their CWP. After evaluation and discussing with a Health Officer we came to the conclusion that if the community had any kind of education they would not interpretate that as education but as something that has to be done. In the time of this research there was once a selection of a new committee at CWP 54 and twice a meeting in which was told the responsibilities of the committee and community (at CWP 4 and CWP 12 both in Chibavi, the WC helped already to select the committee). To know the reason why the people clean their CWP, a question was: "why are you cleaning your CWP?" On that question 73 % of the interrogated people answered with: "When it is dirty it is causing diseases."

During the fieldvisits the MA was telling people around the CWP what to do if their CWP was not like it has to be.

There are holes right under the taps at the platform because of wear and tear by the buckets of water. These holes are filled up with water. There are also sugarcane rests. He is pointing the women at the dirt. She has to laugh about that, maybe shyness. The standing area is full of sand and the drain is running in a sugarcane field. The chairwoman is coming, a bit nonchalant. She also gets point at the dirt. Then she becomes silent. (Monday 26th April fieldvisit to Chibavi CWP 8)

Because there were not always many people around the remarks of the MA could easily be forgotten. When a CWP was well maintained he gave the people a compliment. In the meetings we had with the MA he let the people repeat what he said. He did that by asking and letting them finish a sentence. Once in a while the MA even threatens with disconnecting, when the community does not do what he says. Even at a inquiry:

"If you do not collect more than 20 people we are going to disconnect"

Strange enough the people were not very surprised when he said that and even starting to blame the people who did not showed up. Even the WC is telling the community their responsibilities of payment and maintenance, but is not telling them the reason why to maintain. When people are coming to pay, the MA only can tell them they have to take care that the debit balance is not coming to big. Only when the debit balance is coming to big and people do not show up, he is going to visit the CWP or send somebody. What is happening in the field you can not call it education.

- CWP level

Monday 10th of May we had a fieldvisit at Zolozolo and Ching'ambo, the MA was telling at CWP 57 and CWP 55 to clean their standing area and fill it with small stones for drainage. Thursday 13th May we came back. Only CWP 55 had cleaned the standing area. Also CWP 32 were we came on the day they were constructing a new drain and repairing the meter chamber, which is not even theirs but WD's the MA told them to clean their standing area and place small stones and they did. Except from CWP 32 we also selected CWP 34 and 56 for this indicator only 56 they cleaned the standing area and put in small stones. At the day of visit he told the people at CWP 34 not to wash at the CWP. But the question concerning the washing at the CWP showed no difference with other CWP's. At the question why they are keeping their CWP clean all people of CWP 37 were answering that when it is dirty it is causing diseases. At all the other CWP they answered the same, but only with a 60-70 %.

Today he had visited CWP 14, the CWP which was so bad. Last Saturday the cleaned the standing area. They have put small stones for better drainage, which means that....it is all right now.

When we visited CWP 14 for the first time the standing area was filled with water. The MA was telling the people the seriousness of the situation. Three days later they cleaned the standing area and had put in small stones.

4.9.2 Conclusions

When the people fill in the questionnaire that it may cause diseases when the CWP is dirty they should have understood the message given. The reason for not maintaining could be lack of professional help or unawareness of risks of stagnating water around CWP. The people are not told in detail how to maintain the drain when it is broken. The MA knows that dirty tap places are dangerous for health, but is not telling the community every time why they have to clean the CWP.

The MA did not visit some of the CWP's for three years. So if the WC or MCP Chairman supervises the election of a new committee how should the people know to maintain the CWP. The education concerning the CWP's is not that good. People think that they can be disconnected if the WD thinks some things are not all right. If education is given people have to be present as many as possible. They have to be aware that it is for their own good and not because somebody wants it. By threat the community is not really helped.

*Wat te doen? | M: terug te vinden
w alg. educatie
w aanpakkingen*

4.10 INTERRELATIONS

During the investigation it is found out some data of different indicators is related and influences one another. The relations between the indicators are discussed in this paragraph.

When there is not enough capacity, e.g. by pressure problems, the people will not use the tap water for all the needs. They use the tap water only for the most important things. Brewing beer, making bricks or watering the garden are not on that list. The consumption in total is lower when there is only little water running from the tap.

A tap with pressure problems is CWP 24, with a relative high consumption of 2.9 m³/hh/month. This can be explained by air which is running through the meter. A peace corps volunteer working from CC speaks:

"It happens that pipes contain a lot of air, when they open the tap the meter is spinning enormous and you get outrageous meter bills. This was happening to a government school."

The MA confirmed this. When we look at the consumption graphic of CWP 24 (annex 9), the consumption is going up and down with differences in consumption of almost 150 m³/month. We were two times at the place and both times it took a half a hour to fill a bucket of 20 litres, with a lot of breaks when only air was coming through. A little bit more water is coming through early in the morning and late in the afternoon, they told us.

There is no relation between broken taps or structure and volume of water taken from the tap. The convenience of CWP does not prevent the people in taking less water. Because of broken meters, the volume of water consumed could be higher than the average consumption, which the MA takes (calculated

from the months before the meter was broken). Even if the MR is not reading the meters every month and he just fills in a approximation, looking at the months before, the actual consumption could be lower or higher.

If the water quantity is less per household per month, the payment of MK 2. = the balance will go up. At none of the CWP's the consumption is more than they can use for the MK 2. = per month. For MK 2. = per month a household could consume 4.2 cubic metres per month. Most of the CWP do not even reach an average of 3.0 cubic metres per month.

Most of the people in the CWP communities are aware of the quality of the tap water. This influences the use and their preparedness to pay.

Are they aware of the quality or is it just the convenience? It can be conjunction of both. When there is no drain it gets dirty and muddy around the CWP and tap water can be contaminated. At a lot of CWP's it is wet around the structure. It is difficult to solve this when there is no soak away pit or the drain is broken. People of the CWP keep the surroundings around the structure clean from dirt. Washing clothes at the river may be easier than collecting water in buckets from the tap. Because there are a lot of streams running through the city, people can easily take this water and use it for washing clothes. The distance from the CWP to the houses may restrict in getting more water from the tap, then the tap water only may be used for cooking.

A good working organisation influences different aspect in a positive way. If the organisation does not work the O&M of the CWP is bad. It influences the convenience (in case something breaks it has to be repaired as quickly as possible. This is a bit missing on scheme level) and payment, eg. when a committee does not fulfil their responsibilities the community becomes careless to pay or does not trust the committee members anymore and the financial picture of the CWP results in a debit balance. When the balance is in a debit there is no money to buy new taps or cement to repair a broken structure. When the organisation would work properly they could inform the community better about maintenance of the CWP, organisation of committee and how they should contact WD in case of problems.

Education plays an important role in O&M of a CWP. When the community is not educated in how to be hygienic they do not know how to keep the water clean, that stagnating water could contaminate the tap water, that maintenance is important etc.. They should be educated about the risks of contaminated water. If not everybody in the community or even in a household is using the tap water, but a contaminated alternative source this could result in epidemics as Cholera or Dysentery. The convenience of the CWP will decrease if the community is not told how to maintain a drain or what they should do when the drain is broken. You can conclude that education on these points has failed.

5 CONCLUSIONS AND RECOMMENDATIONS

To see if the research fulfilled the assignment we look back at the objective and the questions drawn. The factors which play an important role in the functioning of the scheme are described below.

- Conclusions

- What have been the technical characteristics of successful Operation & Maintenance at scheme level and at standpost level?

The technical construction of the CWP brings about no problems to supply water. The pipe system of the CWP is solid. The cause of no water running through the tap is because of overusing of the water line. *leakages*
The main construction (pipes, pillars and taps) can always let water through. The problem is that sometimes it can not be stopped because of poor quality of the taps. The structure as a whole is not very solid and needs regular maintenance which is hard for the users to do themselves. They need to buy cement and need technical assistance. Because the pumps at treatment works operate on electricity and electricity shortages do not occur frequently people are provided with water most of the time. When a committee consist of man the CWP is better maintained. However the walking distance to the CWP is very acceptable and the fact that the people can use 24 litres per person per day for the MK2. = monthly payment, the actual consumption per person per day is only between 12-17 litres.

Because of limited opening hours of the CWP the people are restricted in getting more water from the tap. That is one of the reasons why the actual consumption is low. The more people are joining the CWP the more difficult it gets to collect all the water they need within the opening hours. Other reasons for the low consumption are pressure problems and the overpopulation of the CWP's. Some of the CWP's are far overcrowded. The CWP scheme has not failed in this case because more people benefit the treated water. The amount of CWP's is not growing with the population growth of the city. *ops. hours*

From the questionnaire was concluded that the people from a CWP community also take water from alternative sources. To see if the remaining need for water is added by alternative sources further investigation has to be done. *pop. growth*

- What have been the financial performances of the CWP's at scheme and standpost level?

The people are prepared to pay for the water because they know that it is treated water, because it is reliable or just because the waterpoint is near to their houses. This MK 2. = per month is not more than 3% of their monthly income. The majority of committee members are women.

The money contributed will not be misused when the committee consist of women because they are afraid to misuse the money collected from the committee. People have to pay the MK 2. = on a morning in the beginning of the month before they draw water. This is a good system because they are some how forced to pay otherwise they do not get water that particular day. The time of payment in the beginning of the months is also good because people get paid at the end of the month. The cashier's office is in the city centre so not difficult to reach. The registration of the payment is excellent.

- What have been the key characteristics of the different directly involved institutions at scheme and standpost level?

Institutions which are directly involved are: committee, the Monitoring Assistant, the Ward Councillor and Water Department. The committee is the most important institution for the CWP. When a committee is not working according to their responsibilities the CWP is not functioning. The organisation is of great influence on the payment of the CWP-users. The Ward Councillor's influences is stricted. He can force people but not educated them in that way his advice would last for long. The Monitoring Assistant influences depends on the frequently of visiting the CWP-users. Except from the MA and MR there is no real concern with the CWP shown by WD itself. In case payment stays behind and the CWP comes in a large debit balance the WD checks the CWP and tells the people to pay the debit or the tap is going to be disconnected.

The WD itself is not really concerned with the CWP's: some CWP's are not visited for the last 2 years by the MA, there are no water meters for CWP (3/4"), only for individual connections (1/2") (because of this water meters are not running for more than half a year) and structures are heavily eroded and damaged. Although there are more people served by CWP's than the by the total number of individual connections, it seems that the WD pays more attention to the individual connections. The WD is more working on commercial basis than on community based management.

The WD tries to work on a commercial basis. They selling as many individual connections as they can which harms the CWP's (pressure problems). On the other hand their policy is to provided water to people who can not afford an individual connection. They selling water at the CWP at a subsidized rate.

The policy of WD in practice is more technical and commercial than community based, which is disadvantageous to the CWP's

The maintenance of the CWP is supposed to be done by the community. However the community is thinking that the WD is responsible for the maintenance. Some of the CWP do know how to maintain the structure. This is a very serious communication failure and essential for the sustainability of the CWP scheme.

- What are the main characteristics of the users of the CWP's?

The main characteristics of the users of the CWP's are that they are used to pay for facilities in the city. They are used to clean, which can be seen at the CWP and house side. Most of the people live near the CWP, which influences the "community feeling", They meet each other every day at the times of drawing water. When there are women in the committee they are afraid to abuse the money and with the filled in "household contribution" form coming to the cash office to pay every month it is difficult to cheat.

It is shown by the investigation that each family member of a tap community is using the CWP water. Because WD is not capable to educate the people this could be done through health education or at school.

The successful factors are:

- In spite of a lot of defects at the CWP, people are not discouraged from using the water point
- Community financial management is working well due to discipline
- The tap water is used for all the household needs
- The water supply system is reliable due to electricity pumps at treatment works and because the electricity supply is reliable
- The acceptable price of water

- Recommendations

The investigation highlights areas within the CWP scheme, which will require intervention. These points include:

- Constructing more CWP's to solve overcrowding together with the rapid growth of the city
- Existing lines must be upgraded to solve the pressure problems
- The two points mentioned above together with education will result an increase of the water consumption per capita per day
- All the CWP's need to be rehabilitated in such a way that the structure is sustainable and easy to maintain for the users
- Monitoring of the CWP's must be done frequently, each CWP at least every three months
- Education can be given in different ways, through schools, CC and WD concerning hygiene, maintenance and responsibilities
- To solve the chlorine problem, extra chlorine should be injected at long distance transport lines in the system

6 REFERENCES

1. Backgroundpaper, Internal WD paper, Project UNCDF Funded 1990-1992, 1990.
2. Community-Based Operation and Maintenance of Rural Water Supplies: A baseline Survey Report for Ground Water, Centre for Social Research, University of Malaŵi, working paper no.1.
3. District Water Supply Fund Financial Plan, 1992/1993 through 1996/1997, Physk Fred U., Financial Management Services Joint Venture, IDA - March 1992.
4. Final Master plan for Water Supply Development, 44 semi-urban centres May 1988, Carl Bro International as inass Kruger and Danish Hydroliia institute volume 1
5. Guidelines for Public Standpost Water Supplies, Monitoring Assistants.
6. Minimum Evaluation Procedure (MEP) for water supply and sanitation projects, WHO, Feb 1983.
7. Piped Supplies for Small Communities, evaluation report, IRC, June 1992.
8. Piped Supplies for Small Communities in Malaŵi, an overview and forward perspective, Centre for Social Research, University of Malaŵi, August 1988
9. Proposed Improvements to 14 District Water Supply Schemes, Government of Malaŵi, Appraisal Report, Gibb Anglion under assignment by the ODA, December 1991.
10. The Malaŵi's Urban Communal Water Point Project, R.Carrie WHO, June 1983.

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