

"The Socio-economic evaluation will consider the behaviour patterns and responses of the different population groups to their environment particularly with regard to their attitudes to health and hygiene and their awareness as to the part water supply and sanitation play in this".

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May 1985,

Nairobi.

ISBN 2172

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THE SURVEY - DESIGN AND METHODS

Survey Areas

Exploratory visits were made with a field assistant/interpreter to every Ward or Sub-Location within the municipal area and six of these selected for survey.

Two densely populated peri-urban "unimproved" sub-locations were selected Manyatta with (1979 Census) 23,000 population and density 1,173 per square kilometre and Nyalenda 11,500 with density 886 per km<sup>2</sup>. The population of Manyatta - the Housing Development Division confirmed - had more single persons, paying higher rents and more for their water than the families of Nyalenda. Though topographically they are similar Nyalenda is further from the town centre and residents are, on average, poorer.

From a small built up section, mostly owner occupied and adjacent to Manyatta known as Migosi, seven householders were interviewed to compare, in particular, health awareness.

Two peri-pheral areas of the town were selected. One (Korando) - beyond the airport - stretching north from the Lake to the hill section called Dago, with a population of about 2,700 (density 663 per km<sup>2</sup>) many of whose residents are in employment in Kisumu. The other Dago itself, to the north of Korando with a particular water deficiency problem but also many employed residents. Into Dago people have moved in recent years despite the water situation. The population figure of 1979 might now be under-estimated.

Finally, two rural Sub-locations were selected. Firstly, the westernmost of the municipality on the north side of the Lake and the most remote, Kanyawegi. Population 7,500 and density 236 per km<sup>2</sup>. At 20 to 30 km from Kisumu town few people commute. The land is often stony, and local residents say rainfall is not good - the hill areas have higher precipitation - and there is obvious rural poverty. A single water pipeline serves people living nearby. Others obtain water from the Lake or seasonal streams.

Chiga Sub-location is part of the Kano Plains area and was seriously flooded during the period of the study. The road beyond Chiga was cut by the River Lielongoni, the centre of the plains, and for vehicles was only passable with great difficulty. Population 5,600, density 264 per km<sup>2</sup>.

## Method

A forty item questionnaire was prepared in English and translated into the Luo language. After scrutiny and verification it was duplicated on to four A4 sheets. Six field interviewers - most awaiting university entrance - were recruited and given one day of training. All spoke the language as their mother tongue. None had a background in health work.

The first interviews took place in Nyalenda, which is smaller than Manyatta, with the consultant available throughout to discuss problems, though few arose. The response of residents was excellent, perhaps because the interview subjects were of serious interest to them, but also, possibly, because the interview instrument was non-threatening and interviewers were encouraged not to seem hurried and also to answer questions as well as to ask them.

Interviewers - working in pairs but as individuals - made traverses from the road, used as a baseline, to the edge of the inhabited area. They selected every fifth compound, choosing one household and interviewing husband or wife. Then they moved eastwards making a second traverse in the reverse direction. Thus, there was a limited sampling coverage of the whole area. The same method, appropriately modified, was used throughout.

Interviews took from 15 to - more often - 30 minutes. With time for walking and preliminaries each interviewer could conduct about six interviews each day. In six days 213 interviews were recorded. The interviewers found the work both interesting and worthwhile. Interviewers were transported to 'the field' by the consultant each day.

## Analysis

The University Computer Centre, the new term having commenced, were unable to assist. Tabulation has been done throughout by hand. Because none of the questions used was formulated to restrict responses to alternative items, coding was done after the survey to fit the data collected. Some questions were designed as "lead-ins" to focus the interviewees attention on to a new topic of enquiry. These have not been coded. Nor have four questions which yielded no additional information.

In all 21 tables have been prepared. The text utilises also notes added by interviewers and comments arising from the direct observations and discussions of the consultant and his field assistant, Lucas Riako Ogella.

### THE SURVEY RESULTS

#### Section 1. WATER. Sources of Water

Table 1      "Where does the family get its water from?"

	Tap	Tap & stream	Indiv. conn.	Lake	Stream Pond	Well Stream	Roof & Stream	Total
Manyatta	15	17	2	-	-	1	-	35
Nyalenda	21	7	-	-	1	2	-	31
Migosi	4	1	2	-	-	-	-	7
Sub totals	40	25	4	-	1	3	-	73
Korando	5	18	1	6	6	-	1	37
Dago	2	7	-	-	18	5	3	35
Sub totals	7	25	1	6	24	5	4	72
Kanyawegi	5	6	1	18	5	1	1	37
Chiga	6	11	1	-	7	5	1	31
Sub totals	11	17	2	18	12	6	2	68
TOTAL	58	67	7	24	37	14	6	213
Percentages (all responded)	27	31	3	11	17	7	3	

In the peri-urban areas - Manyatta, Nyalenda and Migosi - 55 per cent state they get their water from a tap, 34 per cent from a tap and also a stream or similar source, 5 per cent have individual connections, 4 per cent use wells and only one household in 73 obtains water only from a stream or pond.

People, though, are reluctant to state that they obtain water partly from a 'natural' source but probably many of the 55 per cent in fact obtain some water from 'natural' sources. Often this is used for clothes washing.

In Korando and Dago locations four times as many admit they get water from a stream or the lake as well as from a tap, as those who mention only taps as sources (35 per cent as against 8 per cent). Dago has, in fact, only one person out of 35 interviewed who says he gets water only from a tap. Three in the Dago sample obtain water from roof catchments as well as from streams. One collects his tap water using a car.

In Kanyawegi nearly half obtain water from the lake. In Chiga - Kano plains - 41 per cent, mostly by walking substantial distances, obtain some of their water from taps. At the time of the interviews extensive areas were flooded.

Overall 28 per cent of householders interviewed use only the Lake or streams or ponds, and 7 per cent use wells. In all at present 38 per cent use sources for which they do not pay but another 31 per cent make some use of free ('natural') sources.

COLLECTING WATERTable 2. "Distance of Water from House"

	No distance	Less than 1/4 mile (1/2 km)	Up to 1/2 mile (1 km)	Up to 1 mile (2 km)	Up to 2 mls (4 km)	More than 2 mls (4 km)	No answer	TOTAL
Manyatta	4	29	1	-	-	-	1	35
Nyalenda	-	26	3	-	2	-	-	31
Migosi	2	5	-	-	-	-	-	7
Sub totals	6	60	4	-	2	-	1	73
Korando	3	24	7	1	1	1	-	37
Dago	5	4	4	5	13	-	35	
Sub totals	8	28	11	5	6	14	-	72
Kanyawegi	1	16	1	12	6	-	1	37
Chiga	3	20	4	2	1	1	-	31
Sub totals	4	36	5	14	7	1	1	68
TOTALS	18	124	20	19	15	15	2	213
Overall percentages	8%	58%	9%	9%	7%	7%	1%	

(N.B. Some people think still in miles - some in kilometres).

Table 3. "Time Taken to Collect Water"

	Secs. only	Up to 10 mins	Up to 20 mins	Up to 30 mins	Up to 40 mins	Up to 1 hr	Up to 2 hrs	More than	No answer	TOTAL
Manyatta	4	14	6	9	-	-	-	1	1	35
Nyalenda	-	20	4	1	-	1	4	1	-	31
Migosi	2	1	2	1	1	-	-	-	-	7
Sub Total	6	35	12	11	1	1	4	2	1	73
Korando	5	6	7	9	1	4	4	1	-	37
Dago	1	1	6	2	2	5	4	13	1	35
Sub total	6	7	13	11	3	9	8	14	1	72
Kanyawegi	1	5	7	3	2	11	5	3	-	37
Chiga	3	6	6	9	2	-	1	4	-	31
Sub-total	4	11	13	12	4	11	6	7	-	68
TOTAL	16	53	38	34	8	21	18	23	2	213
Overall percentages	7.5	25	18	16	4	10	8	11	1	

Two measures were sought of problems - other than cost - of obtaining water, "Distance of Water from House". (Table 2) and "Time Taken to Collect Water". (Table 3).

Commonly people's sense of the time they take is somewhat better than their perception of distance but because in neither case is recall very reliable one measure can be used to verify the other.

As was anticipated, most people in the peri-urban areas (Manyatta, Nyalenda and Migosi) are close to sources and spend less time collecting water though some spend additional time in queuing at taps and paying.

In the peripheral areas, e.g. in Dago, more than one third of women walk distances of more than two miles. Many cross into Nandi District where, incidentally, they are not welcome and often encounter some hostility. Half the women of Karondo Sub-location spend more than 20 minutes each time they collect water as do those of the two rural sub-locations.



Generally people in the Kisumu Municipality areas we have surveyed do not travel great distances to obtain water. Only 14 per cent travel more than one mile and only 7 per cent more than two miles. The well distributed rainfall makes for numerous 'natural' sources of water around the lake and 38 per cent use these instead of going further to seek the safe water that would help them to maintain the health of their families.

Table 4. "How much do you pay for Water?"

	Do not pay	Pay 10 c.	Up to 15 c	Up to 20 c.	Up to 25 c.	Up to 30 c.	More than 30 c.	No ans	* Free	Meter	TOTAL
Manyatta	-	1	2	7	5	11	5	2	-	2	35
Nyalenda	1	-	1	17	7	4	1	-	-	-	31
Migosi	-	-	-	1	-	2	2	-	-	2	7
Sub total	1	1	3	25	12	17	8	2	-	4	73
Korando	14	15	-	-	-	1	2		4	1	37
Dago	24	-	-	1	-	1	9		-	-	35
Sub-totals	38	15	-	1	-	2	11		4	1	72
Kanyawegi	26	7	-	2	-	1	-		-	1	37
Chiga	14	-	-	2	2	4	7	1	-	1	31
Sub-totals	40	7	-	4	2	5	7	1	-	2	68
TOTALS	77	23	3	30	14	24	26	3	4	7	213
Overall percentages	37	57							3	3	
Those paying only		19	3	25	12	20	22				

\* Water is given free to some households near the prison.

Our sample suggests that 40 per cent, approximately, of households of the area surveyed do not pay for water (3 gave no answer) and 3 per cent (7 households) pay by meter charges. Of the 57 per cent who pay for each container they collect - usually a 'debe' of 20 litres - 22 per cent pay more than 30 cents most paying 50 cents.

Where there are very few individual connections, as in Dago and Chiga (Kano Plains), those with these facilities can charge neighbours - legally - excessively, i.e. 50 cents or more. Where more individual connections and licenced selling points ("kiosks") exist prices tend to be uniform; in Manyatta 30 cents, in Nyalenda 20 cents per debe. Members of the extended family and tenants often pay less than the prevailing price to "outsiders".

Water transported by handcart - Manyatta and Nyalenda - or on the back of a donkey, in peripheral and rural areas, to the purchaser's door usually costs at least Sh.1 per debe. Water selling has, in some areas, become an occupation. The water sellers charge more when the piped supply fails or the stream dries up compelling them to travel further to obtain supplies.

### Intermittent Supply

Table 5. "Days without water from the tap"

	No answer	1 day or less	Up to 2 days	Up to 4 days	Up to 1 wk	Up to 3 wks	Up to 1 month	More than 1 mon.	TOTAL
Manyatta	8	5	4	11	4	1	1	1	35
Nyalenda	5	17	5	3	-	1	-	-	31
Migosi	3	3	-	-	1	-	-	-	7
Sub totals	16	25	9	14	5	2	1	1	73
Korando	15	6	3	1	7	5	-	-	37
Dago	25	-	-	-	2	-	6	2	35
Sub-totals	40	6	3	1	9	5	6	2	72
Kanyawegi	27		2	4	3	1	-	-	37
Chiga	16	3	2	6	1	3	-	-	31
Sub totals	43	3	4	10	4	4	-	-	68
TOTALS	99	34	16	25	18	11	7	3	213
"No answer" = 46%									
Percentages of responding -		30	14	22	16	10	6	3	

Including those who were unsure, as well as those who did not use piped water, 46 per cent were classified as "No answer".

The answers of the 54 per cent giving positive responses - representing 114 households - show a diversity hard to explain considering that they - in most sub-locations - share the same supply. One possible factor is length of residence, another length of memory, but a third may be a felt response to the degree of inconvenience arising from a break in supply. (Respondents could assume that our survey would lead to action and might, accordingly, "exaggerate").

Householders store water in a tank or large earthen-ware pot. An interruption in supply of several hours, or even a whole day, may not cause severe problems though residents are rarely informed in advance. A break in supply of more than 2 days will usually force people to revert to alternative supplies either from "natural sources" - which may through neglect have become seriously polluted - or to extra-ordinary measures such as walking long distances or using motor vehicles..

Manyatta has a history of supply breakdowns and of inadequacies in dry seasons. Dago has a daunting history with very little water on the higher areas into which people have been moving and a piped supply scheme using water from the Orinde River at Ogala in Kakamega District which failed after a short period. Breakages in plastic piping that may have been badly laid, and thefts at the pumping station have ensured that it has remained non-functional.

The two pipelines serving Kanyawegi and Chiga respectively, have also experienced breakdowns lasting longer than two days, prolonged, it would seem, by distance from the water engineering workshop responsible.

Perception of Water Quality

Table 6. "Is the water from streams (and 'natural sources') good?"

	No answer	Brings sickness	Muddy-dirty	Salty	Animals	Not treated	Good	Clear	Other	Total
Manyatta	18	2	7	-	-	5	1	-	2	35
Nyalenda	21	5	2	-	-	-	1	-	2	31
Migosi	6	1	-	-	-	-	-	-	-	7
Sub-total	45	8	9	-	-	5	2	-	4	73
Korando	5	8	11	2	-	-	9	2	-	37
Dago	2	1	7	-	-	-	24	-	1	35
Sub total	7	9	18	2	-	-	33	2	1	72
Kanyawegi	8	4	12	1	2	3	6	-	1	37
Chiga	5	5	9	1	-	1	8	1	1	31
Sub totals	13	9	21	2	2	4	14	1	2	68
TOTALS	65	26	48	4	2	9	49	3	7	213
Percentages - those responding only		18	32	3	1	6	33	2	5	
				60%				35%		

This question was asked only of those householders using 'natural sources'. It was asked to give an insight into their perception of the quality of water from streams, ponds, etc. Of that 60 per cent who say that water from 'natural sources' is not good over half (32 per cent) state that it is muddy or dirty and only 18 per cent are aware that it could bring sickness, though another 6 per cent would prefer "treated" water.

In Dago Sub-location, where there is no convenient piped water, most (69 per cent) think their stream water is good. Most draw from springs as they emerge from hillsides. In rural Kanyawegi, where streams are seasonal, and in flood carry much sediment, 78 per cent (22 of 28) think stream and pond water is not good, though many think the lake water is good. Overall 60 per cent of those using water from natural sources prefer better water. Most, though, want water that looks "clean". Only 35 per cent think water from "natural sources" is good.

Water QualityTable 7. "Which is the best water?"

	No answer	Tap	Lake	Stream or pond	Well	Roof	None	Total
Manyatta	7	28	-	-	-	-	-	35
Nyalenda	2	29	-	-	-	-	-	31
Migosi	2	5	-	-	-	-	-	7
Sub-totals	11	62	-	-	-	-	-	73
Korando	6	22	6	3	-	-	-	37
Dago	3	10	-	10	5	1	6	35
Sub-totals	9	32	6	13	5	1	6	72
Kanyawegi	1	17	18	1	-	-	-	37
Chiga	7	12	-	7	3	1	1	31
Sub-totals	8	29	18	8	3	1	1	68
TOTALS	28	123	24	21	8	2	7	213
Percentage of those responding		66	13	11	4	1	4	

Table 8. "What makes it good?"

	No answer	Treated	Only source	Best we have	Cheap	Clean. Clear	Other	Total
Manyatta	11	14	2	-	-	8	-	35
Nyalenda	5	19	-	-	1	3	3	31
Migosi	2	1	-	1	-	2	1	7
Sub-total	18	34	2	1	1	13	4	73
Korando	12	14	3	-	-	8	-	37
Dago	11	8	6	8	-	1	1	35
Sub-total	23	22	9	8	-	9	1	72
Kanyawegi	5	12	3	7	-	6	4	37
Chiga	9	9	1	1	-	10	1	31
Sub-totals	14	21	4	8	-	16	5	68
TOTALS	55	77	15	17	1	38	10	213
Percentage of those responding		49	9	11		1	24	6

To probe attitudes to water respondents were asked "Which is the best water?". Most (66 per cent) chose tap or piped water, and when further asked "What makes tap water good?" many responded "Because it is treated". (49 per cent of those responding.)

But in rural Kanyawegi half said that they were satisfied that the lake water was the best, but then gave replies such as "because it is our only source" or "the best we have" or, in 6 cases - the disturbing answer - "because it is clear" or "clean".

Altogether 30 per cent of those responding gave unsatisfactory answers such as "clear", "clean", "flowing", "tastes sweet", and "fresh - not salty". There appears to be a case for a programme to teach people the meaning of "water quality" though in Dago 6 people said there was no "best" water which they could get.

Safeguarding Water QualityTable 9. "Do you do anything to make the water better?"

	No answer	'No'	Boil	Add chemicals	Decant	Filter	Total
Manyatta	7	18	9	-	-	1	35
Nyalenda	2	20	7	-	1	1	31
Migosi	-	7	-	-	--	-	7
Sub-total	9	45	16	-	1	2	73
Korando	-	18	12	3	-	4	37
Dago	-	17	15	-	1	2	35
Sub-total	-	35	27	3	1	6	72
Kanyawegi	-	13	21	1	2	-	37
Chiga	2	15	13	1	-	-	31
Sub-total	2	28	34	2	2	-	68
TOTALS	11	108	77	5	4	8	213
Percentages - of those responding		53	38	2.5	2	4	8.5

Table 10. "Can you spoil water in the house?"

	No answer	'No'	'Yes'	Dust rubbish	Dirty hands	Other	Don't know	Total
Manyatta	11	9	1	1	1	8	4	35
Nyalenda	9	6	-	2	4	6	4	31
Migosi	2	-	2	-	-	-	3	7
Sub-totals	22	15	3	3	5	14	11	73
Korando	13	17	-	2	1	4	-	37
Dago	4	8	2	3	3	8	7	35
Sub-totals	17	25	2	5	4	12	7	72
Kanyawegi	6	3	6	10	2	1	9	37
Chiga	6	16	1	3	-	3	2	31
Sub-totals	12	19	7	13	2	4	11	68
TOTALS	51	59	12	21	11	30	29	213
Percentages - of those responding		36	7	13	7	19	18	

"Do you do anything to make the water better?" was asked to find the proportion of respondents showing some concern about water quality. The 108 (53 per cent), though, responding "no" exceeds the number (64) claiming to use only piped (tap) water. The number (77 or 38 per cent) stating "boil" must be accepted with reservation. This is a reply often given but frequently not justified in practice - the cost and inconvenience of boiling are too great - and, secondly, water may be boiled only to "make tea". Included in "Add chemicals" were those who say they add chlorine. "Filter" usually means "pass through a cloth" to catch large solids.

Improving water in the home is difficult, and boiling, though satisfactory, is an expensive procedure consuming scarce fuel. There is in the home no easy solution to water of poor quality and the replies reflect this.

"Can you spoil water in the house?" was asked to throw light on perceptions of hygiene in relation to water. A large proportion (51 or 24 per cent) did not respond and another 29 say they "do not know" and 59 state specifically "no". Thus 139 (65 per cent of all interviewed) are either mistaken or "do not know".

The most frequent positive answer is that water can be spoiled by "dust" or "rubbish" - which is less satisfactory than "hands". The replies under "other", when examined, show that 12 householders feel - correctly - that a dirty storage vessel can spoil water, but only 7 mention "dipping dirty things" into the water. One of these mentions putting the calabash - after washing the face - back into the water again; one "using dirty utensils" and one "using the cup they have been drinking from".

The conclusion must be that there is very little awareness of the danger of pollution of water by human contact.



## Sickness and Water

Table 11. "What sickness comes from bad water?"

	No answer	Dont know	Skin disease	'Stomach' etc.	Bilharzia	'Stomach' & bilharzia	Malaria	'Stomach' & malaria	'Stomach, bilharzia malaria	Others	Total
Manyatta	3	5	2	13	1	4	3	4	-	-	35
Nyalenda	2	1	-	15	-	3	3	2	4	1	31
Migosi	1	1	-	3	-	1	-	-	1	-	7
Sub-total	6	7	2	31	1	8	6	6	5	1	73
Korando	-	7	2	16	1	5	2	3	1	-	37
Dago	-	11	-	11	-	6	-	3	2	2	35
Sub-total	-	18	2	27	1	11	2	6	3	2	72
Kanyawegi	1	2	1	17	1	6	2	3	4	-	37
Chiga	1	6	-	4	1	12	1	1	5	-	31
Sub-total	2	8	1	21	2	18	3	4	9	-	68
TOTALS	8	33	5	<u>79</u>	4	<u>37</u>	11	<u>16</u>	<u>17</u>	3	213
Percentages - of those responding		16	2	39	2	18	5	8	8	1	

How far are people aware that particular sicknesses can be transmitted by bad water? In Kisumu many have some knowledge. E.g. 79 + 37 + 16 + 17 (i.e 149) of those interviewed mentioned "stomach" or a diarrhoea related disease. But many of them and others - also mentioned "bilharzia" or "malaria". A few (5) mentioned "skin disease". Under "others", in Table 11, were mentioned sorethroat, whooping cough, influenza, measles and insomnia!

Of those 205 responding to this question 33 (16 per cent) state that they do not know the answer. The general picture is of a lack of knowledge and of mistaken assumptions of a serious order.

**Table 12. "Would you be prepared to pay for better water?"**

	No answer	5 c.	10 c.	15 c.	20 c.	More than 20 c.	By meter	"Yes"	Un sure	"No"	Totals	
Manyatta	3	-	-	-	-	5	10	10	1	6	35	
Nyalenda	1	-	-	-	1	2	12	10	2	3	31	
Migosi	2	-	-	-	-	-	-	5	-	-	7	
Sub-total	6	-	-	-	1	7	22	25	3	9	73	
Korando	1	-	9	1	1	-	8	6	1	10	37	
Dago	1	-	-	-	1	10	11	9	-	3	35	
Sub-total	2	-	9	1	2	10	19	15	1	13	72	
Kanyawegi	1	1	8	-	1	5	4	14	1	2	37	
Chiga	1	1	-	1	7	1	7	5	-	8	31	
Sub-total	2	2	8	1	8	6	11	19	1	10	68	
TOTALS	10	2	17	2	11	23	52	59	5	32	213	
Percentage - of those responding		1	8	1	5	11	26	29	2	16		
					81%						18%	

The final question asked on water was "Would you be prepared to pay for better water?" Though some already have meters this question was asked of all householders interviewed and 32 (16 per cent) gave a definite "no". Only 5 (mostly wives) were unsure. In the peri-urban areas where people are already paying - generally for each container of water - there is demand, as elsewhere, for payment by meter.

It has been suggested that 20 cents is often the approximate cost of producing and "delivering" water. Five per cent of respondents are prepared to pay precisely 20 cents - or said so at the interviews - but 11 per cent would pay more, i.e. 16 per cent in all. Payment by meter is preferred by 26 per cent. That 81 per cent accept the idea of payment for water is encouraging. This response is found throughout the areas surveyed but in Korando and rural Kanyawegi significant numbers would like to pay no more than 10 cents for 20 litres. Sheer poverty - some stated they have no income - must be considered a possible factor in these Sub-locations.

Section 2.LATRINES AND LATRINE USETable 13. "Do you have a latrine? How many years ago - in what year - was your latrine built?"

	No answer	Before '70	71-73	Built 74-76	'77-79	'80-2	'83-5	"Yes"	Used to have	"No"	Total
Manyatta	-	1	2	5	4	9	10	1	-	3	35
Nyalenda	2	5	2	6	4	8	4	-	-	-	31
Migosi	-	1	1	2		1	2	-	-	-	7
Sub-total	2	7	5	13	8	18	16	1	-	3	71
Korando	-	2	1	1	4	8	5	1	6	9	37
Dago	-	1	2	2	5	5	6	-	5	9	35
Sub-total	-	3	3	3	9	13	11	1	11	18	72
Kanyawegi	1	1	-	3	4	5	6	-	2	15	37
Chiga	-	-	2	2	1	7	9	-	3	7	31
Sub-total	1	1	2	5	5	12	15	-	5	22	68
TOTALS	3	11	10	21	22	43	42	2	16	43	211
Percentages of those with or without latrines		5	5	10	10	20	20	1	28	(without)	
Percentage of latrines built: (a) before 1977 = 28, (b) after 1977 = 71 per cent.											

Respondents were asked "Do you have a latrine?" and then, to those giving positive replies, "In what year was your latrine built?" The 28 per cent who do not have latrines live in rural Kanyawegi, where 46 per cent have no latrine, but also in Chiga (32 per cent without latrines) - where flooding causes latrines to cave in - and also in peripheral Korando and Dago, (40 per cent of each without latrines). Dago has areas of hard rock. The lake area of Korando, where there is livestock rearing, has fewer latrines.

Table 14. "How many people use the latrine?"

	No answer	0-10	11-20	21-30	31-40	41-50	51-60	60+	"All"	Total
Manyatta	3	6	4	2	3	-	-	1	16	35
Nyalenda	2	7	7	4	1	1	1	-	8	31
Migosi	-	-	-	-	-	-	-	-	7	7
Sub-total	5	13	11	6	4	1	1	1	31	73
Korando	15	12	1	-	-	-	-	-	9	37
Dago	14	8	3	2	-	-	-	1	7	35
Sub-total	29	20	4	2	-	-	-	1	16	72
Kanyawegi	18	7	6	-	1	-	1	-	4	37
Chiga	10	5	4	-	-	-	-	1	11	31
Sub-total	28	12	10	-	1	-	1	1	15	68
TOTALS	62	45	25	8	5	1	2	3	62	213
Overall percentage	29								29	
Percentage of latrines in use		51	28	9	6	1	2	4		

When respondents were asked "How many people use the latrine?" 29 per cent did not give an answer - of course 28 per cent have no latrine - and another 29 per cent said simply "all". Only the smallest children do not use the latrine, we learned. Most latrines, the survey would suggest, are used by 10 people or less. The very high numbers of users listed for some latrines may not be reliable. Numbers tend to be - as would be expected - higher in the peri-urban areas (Manyatta and Nyalenda), but some compounds each have more than one latrine stall.

One Manyatta resident stated he uses his neighbour's latrine having no space to built one on his plot. Another Manyatta resident because the pit of his cement built latrine was becoming full, dug a much deeper pit nearby and pushed a hole through to drain the full pit.

The Importance of Latrines

Table 15. "Why is having a latrine important?"

	No answer	Normal Usual	Control disease	Control flies	Other	Don't know	Totals
Manyatta	4	6	18	2	-	5	35
Nyalenda	4	7	15	3	-	2	31
Migosi	-	3	3	1	-	-	7
Sub-total	8	16	36	6	-	7	73
Korando	7	18	11	1	-	-	37
Dago	3	4	19	2	2	5	35
Sub-total	10	22	30	3	2	5	72
Kanyawegi	3	6	24	2	-	2	37
Chiga	2	9	18	-	-	2	31
Sub-total	5	15	42	2	-	4	68
TOTALS	23	53	108	11	2	16	213
Percentage of those responding		27	57	6	1	8	

"Why is having a latrine important?" was asked to throw light on people's motivation for latrine construction. The most important (57%) would seem to be "control of disease" but some mentioned "malaria" and other not very relevant diseases.

"Normal, usual" suggests "social pressure", or a "common habit" as an important motivation. "Control of flies" may be an important motive in peri-urban, high living density, areas.

The two replies classed as "Other" were "A child can eat the faeces lying around" and "To avoid going to the bush in case of a long call (defecation)". The latter implies that for urinating no latrine is necessary! In rural Kanyawegi we were told that more land is cultivated bushes tend to be further from the house involving a longer walk.

Table 16. Latrines - Structure

	No latrine	Cement with iron roof	Cement thatch	Cement no roof	Mud iron roof	Mud thatch roof	Mud no roof	Other Other	Total Total
Manyatta	4	20	2	-	7	-	2	-	35
Nyalenda	-	14	-	7	6	1	2	1	31
Migosi	-	6	1	-	-	-	-	-	7
Sub-total	4	40	3	7	13	1	4	1	73
Korando	15	8	2	-	4	4	4	-	37
Dago	15	11	1	-	4	-	2	2	35
Sub-total	30	19	3	-	8	4	2	6	72
Kanyawegi	17	4	-	-	5	4	1	6	37
Chiga	10	3	-	-	4	9	1	4	31
Sub-total	27	7	-	-	9	13	2	10	68
TOTALS	61	66	6	7	30	18	8	17	213
Percentages - latrines only		43	4	5	20	12	5	11	

Interview<sup>ers</sup> were asked to describe latrines. Construction methods for latrines tend to follow fashions and, secondly, to be related to house construction methods. The preference of those who can afford them is for cement structures - including cement faced brick - with corrugated iron roofs, that is for "permanent" structures. In the peri-urban areas surveyed these structures have hinged wooden doors and are well maintained even though some have now no roofs. The corrugated iron deteriorates before the cement.

In peripheral areas - with less latrines - mud and thatch, with floor slabs of mud spread over wood poles, still continue, sometimes with iron roofs to protect the mud walls. In the rural sub-locations there are at present few cement structures.

A mud and thatch structure is difficult to keep clean, and also to maintain. The life of such a latrine without maintenance, may be as little as three years. Sacks or cloths screen the doorways. Many of these structures were partly broken down and some abandoned or very little used.

Table 17. "Cleanliness of Latrine"

	No latrine	Good - excellent	Fair	Poor dirty	No comment	Totals
Manyatta	4	15	9	6	1	35
Nyalenda	-	13	7	10	1	31
Migosi	-	4	-	3	-	7
Sub-total	4	32	16	19	2	73
Korando	15	17	3	2	-	37
Dago	15	10	7	-	-	35
Sub-total	30	27	10	5	-	72
Kanyawegi	17	6	5	6	3	37
Chiga	10	12	2	7	-	31
Su Sub-total	27	18	7	13	3	68
TOTALS	61	77	33	37	5	213

Assessing "cleanliness" must tend to be subjective, but the hygienic state of latrines in multi-family use in Manyatta and Nyalenda is remarkable. Good structures are more easily maintained, and people clearly like good structures.

In rural, and impoverished, Kanyawegi the situation is far less satisfactory. There are signs that latrines, where they exist, may not be used consistently. In Chiga the floods and black cotton soil compound the maintenance problem, but cleanliness is better.

For family health a dirty latrine with contaminated squatting slab can be more dangerous - in transmission of helminths (worms) and gastro-enteritis type diseases - than use of bush areas. Cement squatting slabs are, in practice, almost essential for good hygiene.



Paying for a better latrine.Table 18. "Would you be willing to pay towards the cost of a good latrine?""Shs. per month "

	No answer	Shs 10	Shs 20	Shs 30	Shs 40	Shs 50	More than 50	"Yes"	Unsure	"No"	Totals
Manyatta	1	-	1	4	-	2	4	10	3	10	35
Nyalenda	4	-	1	-	1	7	2	12	1	3	31
Migosi	-	-	-	-	1	-	-	2	4	4	7
Sub-total	5	-	2	4	2	9	6	24	4	17	73
Korando	1	-	4	3	-	1	4	10	-	14	37
Dago	1	-	4	1	-	-	3	16	3	7	35
Sub-total	2	-	8	4	-	1	7	26	3	21	72
Kanyawegi	1	4	5	1	1	2	1	16	3	3	37
Chiga	1	3	6	3	-	-	-	6	2	10	31
Sub-total	2	7	11	4	1	2	1	22	5	13	68
TOTALS	9	7	21	12	3	12	14	72	12	51	213

Responses to this type of question have to be reviewed cautiously. Fifty-one respondents are not willing to contribute to an improved latrine, **Some** because they already have a good one, others no doubt, because they have difficulty in finding money for their daily necessities.

A further 72 - one third of those responding - say they would pay but mention no amount. But 69, another one-third, mention sums they feel they could pay. This is, probably, satisfactory evidence for assuming a contributory latrine building programme could succeed.

The amounts people in the rural and peripheral areas could be expected to pay are, however, small.

## SECTION 3

## SICKNESS AND HEALTH AWARENESS

Table 19

"Have members of your family been sick since Christmas?"  
 "What was the sickness?"

	"No"	Malaria	Gastro enteritis	Bil- harzia	Malaria+ G. enter.	Gastro- enteritis +Bilharzia	Malaria+ +G. enter. +Bilharzia	Other	Totals	Additional Sickness
Manyatta	16	6	2	1	7	-	-	3	35	9
Nyalenda	8	7	5	-	7	1	-	3	31	13
Migosi	4	3	-	-	-	-	-	-	7	
Sub-total	28	16	7	1	14	1	-	6	73	22
Korando	12	8	4	-	7	-	-	6	37	7
Dago	12	11	4	-	4	1	1	2	35	9
Sub-total	24	19	8	-	11	1	1	8	72	16
Kanyawegi	7	5	4	-	17	-	2	2	37	12
Chiga	6	4	1	-	15	-	1	4	31	6
Sub-total	13	9	5	-	32	-	3	6	68	18
TOTALS	65	44	20	1	57	2	4	20	213	56
No sickness - per cent-30										
Total malaria		44			57		4	=	105	
" Gastro- enteritis			20		57	2	4	=	83	

\* "Additional sickness" = episodes of other sickness additional to those listed but for the same families

To collect records of episodes of sickness occurring over a period lasting more than two weeks serial visits are essential, because such episodes are quickly forgotten. The data of Table 19 must be accepted as indicative only. For example, malaria may itself have gastro-intestinal symptoms. However, that the families visited have heavy loads of sickness, especially of gastro-enteritis and malaria, is very likely. Bilharzia, on the other hand, does not appear as frequently as records from other sources would suggest. Without readily available health service facilities for diagnosis, people may not, in fact, know the sickness from which they are suffering.

SICKNESS AND HEALTH AWARENESS (2)

Table 20

"What causes these sicknesses: Malaria, Measles, Cholera, Coughs, Diarrhoea?"

	Malaria			Measles			Cholera			Coughs			Diarrhoea		
	Correct	Wrong	No answer	Correct	Wrong	No answer	Correct	Wrong	No answer	Correct	Wrong	No answer	Correct	Wrong	No answer
Manyatta	12	3	20	-	-	35	13	1	21	6	-	29	9	-	26
Nyalenda	19	1	11	-	2	29	8	3	20	1	3	27	9	-	22
Migosi	7	-	-	-	-	7	6	-	1	1	-	6	3	-	4
Sub-total	38	4	31	-	2	71	27	4	42	8	3	62	21	-	52
Korando	17	3	17	5	1	31	16	-	21	8	2	27	12	-	25
Dago	6	4	25	-	-	35	12	-	23	3	1	31	9	-	26
Sub-total	23	7	42	5	1	66	28	-	44	11	3	58	21	-	51
Kanyawegi	16	1	20	1	-	36	14	3	20	9	1	27	17	2	18
Chiga	14	3	14	-	1	30	12	1	18	4	-	27	6	-	25
Sub-total	30	4	34	1	1	66	26	4	38	13	1	54	23	2	43
TOTALS	91	15	107	6	4	203	81	8	124	32	7	174	65	2	146
Percentages for each sickness	43	7	50	3	2	95	38	4	58	15	3	82	30	1	69

Whenever it was at all possible answers were accepted as "correct" e.g. for malaria "mosquitoes", for coughs "dust", and "smoke". Most respondents, though, were not aware that cholera and diarrhoea are usually transmitted in similar ways. Despite family responsibilities very few knew that measles is transmitted from child to child - one reply was "ghosts". Malaria, some thought, was caught by drinking water with mosquito larvae in the water. Diseases were also attributed to changes in the weather.

The next section shows some of the consequences of this confusion concerning the causes of common diseases.

Table 21. "How could some of these sicknesses be prevented?"

	Malaria			Diarrhoea Stomach diseases			Bilharzia			Other			Total
	Method ✓	Method X	No answer	Method ✓	Method X	No answer	Method ✓	Method X	No answer	Method ✓	Method X	No answer	
Maryatta	7	3	25	14	3	18	-	-	35	-	7	28	35
Nyalenda	5	9	17	6	4	21	-	-	31	1	6	24	31
Migosi	2	-	5	2	2	3	-	-	7	-	-	7	7
Sub-total	14	12	47	22	9	42	-	-	73	1	13	59	73
Korando	8	4	25	12	4	21	-	-	37	2	5	30	37
Dago	6	5	24	7	3	25	-	-	35	-	12	23	35
Sub-total	14	9	49	19	7	46	-	-	72	2	17	53	72
Kanyawegi	8	6	23	9	-	28	-	-	37	1	10	26	37
Chiga	6	6	19	10	1	20	-	-	31	-	8	23	31
Sub-total	14	12	42	19	1	48	-	-	68	1	18	49	68
TOTALS	42	33	138	60	17	136	-	-	213	4	48	161	213
Percentages by sick- nesses	20	15	65	28	8	64	-	-	100	2	23	75	

The final table shows how vulnerable lack of knowledge makes Kisumu respondents. Though they live around the Lake and by streams no one interviewed knows that you can prevent bilharzia by not going into streams. Though the connection between malaria and mosquitos was known to 43 per cent (Table 20) only 20 per cent have relevant knowledge on prevention of malarial infection.

Invited to choose "other" diseases which interested them, 23 respondents thought only of visiting a health facility to receive tablets- or of buying - some tablets.

Positive health awareness is far below that necessary even to make use of simple precautions. In a cotton growing area only two of those interviewed mentioned the protection against malaria a mosquito net can give. Interviewers were told of recent deaths from malaria of two children and of one death from cholera.

The concept of prevention through taking independent action has, so far, made very little impact in the areas surveyed.

PART 2.      HEALTH IN KISUMU

1.      The Present Health Situation in Kisumu Municipality

The data available from which to assess the health situation of a community in a developing country is rarely satisfactory. Sick people may report to a government health facility, to a private facility, or to a physician, a traditional practitioner, a friend, or to no one outside the family. Only by a continuous monitoring procedure can valid data be obtained, and then only at a cost similar to that for providing services.

In Kisumu the Aga Khan Health Services Project is focussed only upon Kajulu Location, and may obtain reliable data for that location but the project is at present only one year old. The Kajulu results will be instructive but not conclusive for other locations and sub-locations.

The best data available now is contained in the recently issued "1983 Annual Report of the Public Health Department of Kisumu", and, secondly, in the "1981 Annual Report of the provincial medical officer, Nyanza Province". The Public Health Department operates seven Health Centres, and Dispensaries at which, in 1983, more than 467,000 patients were seen. The Provincial Medical Officer is responsible - under the Ministry of Health - for Nyanza Province General Hospital which in 1981 had 337,700 new out-patient attendances (Provincial Hospital patients can come from outside the area of the Municipality, the Public Health Department facilities are also open to all as are the services of adjacent authorities and of private organisations within the municipal area, including the Aga Khan Hospital.)



The Public Health Department Report lists only  
"Communicable Diseases Notified". It includes:

Malaria Clinical	73,669 )	
"    proved*	1,433 )	55% of total
Dysentery	3,091 )	
Gastroenteritis	5,831 )	8.2% of total
Amoebiasis	2,312 )	
Ankylostomiasis (Hookworm infection)	2,207	1.6% of total
Bilharzia	273	
Trachoma	35	

\* I.e. by microscopic examination.

Total cases notified 136,416 i.e 30% of the 467,000 seen.

The Nyanza General Hospital Report lists all recorded  
Out-patient cases including:

		(Per cent of total)
Malaria	84,096	25
Diarrhoea	38,834	11.5
Skin diseases	31,397	9.3
Intestinal worms	4,326	1.3
Bilharzia	261	.07
Acute eye infections	5,295	1.6

Total new cases, i.e. not including reattendances - 337,696

The very high levels of sickness in Kisumu suggested by these figures is striking. Also the importance of malaria and of water related diseases.

Water borne diseases include amoebiasis, diarrhoeas with dysentery and gastro-enteritis. The Kisumu area has been considered an endemic focus of cholera; there were epidemics in 1974-5, 1980-1 and sporadic cases in 1983. The problem of water-borne diseases is especially serious in heavy rains.

Water hygiene - or "water washed"-diseases, include skin diseases which reach serious levels in the area, the Nyanza General Hospital recording no less than 31,000 cases in 1981. (No figures for the Public Health Department are available because "skin diseases" are not notifiable.)

Trachoma is typically a disease of dry areas where scarce water is sparingly used for washing the body and especially the face. The P.H. Department, however, record in 1983 35 cases. Since, though, ophthalmic treatment facilities are concentrated at Nyanza General Hospital the figure of 5,295 "acute eye infections" is probably more significant, trachoma being the major cause of eye infections.

Water contact - or "water based" - diseases. In Kisumu both forms of bilharzia (schistosomiasis) are common. Fishermen tend to be infected with the more severe intestinal form (S. Mansonii); people who go into streams or ponds to collect water or to bathe have the urinary form (S. haematobium). Both forms are persistent; both are difficult and expensive to treat and progressively debilitating. They are usually under-recorded because in a family or community they may be so widespread as to be accepted as "normal". Then sufferers do not seek treatment.

Water related diseases arise from the water habitat of the vector transmitting the disease. Whilst most African tropical diseases occur in high prevalence in Kisumu, malaria is the leading cause of morbidity and mortality in the lowland areas around Lake Victoria. Malaria is most dangerous to children and expectant mothers particularly those who are malnourished and who have hookworm infestations and iron deficiency anaemia.\*

Hookworm infestation arises from poor sanitation; the eggs of hookworms in faeces deposited on the ground hatch there into larvae. These larvae penetrate the skin, usually of the foot, and soon attach themselves to the wall of the small intestine

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\* p.95. "Kisumu Primary Health Care Project Proposal"  
Aga Khan Health Services July 1985

causing blood loss and so anaemia. Larvae may also be swallowed with the same consequences.

Other intestinal worms, especially ascaris/round worms cause nutritional deficiency. They are transmitted by hands made dirty from lack of toilet hygiene, especially from not washing after the use of unclean latrines.

Generally "The problems of high rates of morbidity and mortality in Kisumu District are the results of multiple inter-related factors of which the most important are the tropical climate, poor water supply, poor sanitation, poor soil quality, inadequate vector control, high fertility rates, rapid population growth, high unemployment and low family incomes".\*

Except that our data does not confirm "rapid population growth" as a factor, this statement seems to fit the facts. It must be recognised, though, that provision of improved water supplies and sanitation will not, by themselves, lead to the health improvement that can play a large part in better family well being.

"The control of waterborne disease is complicated and difficult and cannot be achieved by technical means alone. Such factors as human behaviour patterns, lack of education, crowding, poverty, and lack of basic understanding of personal and household hygiene can over ride the proven health enhancing potential of even safe water and sanitary excreta disposal systems." (F.E. McJunkin "Water and Human Health", USAID Washington. July 1982 and March 1983 p.93).

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\* Ibid.

2.(a) Responses of Groups to their environment - their  
behaviour patterns

Latrines

The survey shows the value people in Kisumu place upon cleanliness. The residents of Manyatta and Nyalenda not only have and use latrines, they maintain and improve them. They also, in general, keep them remarkably clean despite use by several families or by numerous individuals. The Kisumu Municipality (1983) report of the Housing Development Division "V.I.P. Latrines" programme (Appendix 1), shows the wide interest in better latrines. Although in future those wanting VIP latrines will probably have to do digging and also make an agreed payment, the report shows that 33 per cent might pay as much - or more - than Shs 1,000.

In peripheral areas - like Dago and Korando - interest in latrines is high. The problem of their provision has been accentuated by recent increases in the price of cement and its transport since the evidence is that only solidly built structures are consistently maintained in a hygienic condition; the essential equation opposes cost of construction to family resources. One goal should be to reduce costs to householders by, for example, lending tools, demonstrating methods, and subsidizing materials to encourage the maximum self-build effort. Traditional groups and associations can help. Developing motivation through community sensitization and hygiene education is needed to ensure smooth progress. The building programme should not be undertaken until the support of existing local groups and associations is secured.

In the rural areas - as illustrated by Kanyawegi and Chiga - the problems are similar but the gaps between aspirations and their realisation made by rural poverty is wider. Privacy is important in rural areas but multi-family use not a factor; superstructures can be made of less strong or permanent materials but latrine slabs need to be made of cement.

To make cement slabs "in situ" requires skills and tools that not all farmers may have, and uses much cement. So, ferro cement slabs that present a less serious transport problem, and which, incidentally, can be moved when a new latrine is required, should be made at a central point for sale at cost, or at a subsidized price.

In rural settings, more simple superstructures will meet needs, and with advice, and the use of models or demonstrations, can be made by rural people.

In more traditional rural settlements taboos still operate that prevent certain members of a family of opposite sexes using the same latrine. They can also make crossing one another's paths on the way to the latrine objectionable. Thus, two separate latrines placed in different directions away from the house, may be required.

Community schemes in which each member pays an amount monthly and then each month there is a draw to select those families who are to receive cement slabs could be an effective component of a community hygiene promotion campaign.

In urban high density settlements it must be recognised that latrines will fill up. The soils of Manyatta and Nyalenda are largely consolidated laterite muds and not very permeable. If sewers cannot be installed for several years then thought must be given to a programme of emptying latrines. Built largely of permanent materials on small plots, there may be no alternative.

At present there seem to be few current activities that - like cultivation - might increase the hazards of latrines built close to houses. Infants and toddlers do, though, play on the bare earth. If more water is used by residents the dangers will increase. Latrines should be lined for part of their depth. The danger of contaminated sullage and surface flow-off in heavy rains may become serious.

Roads are not made up or maintained and tend to follow indentations made by flows of surface water. Should it not be possible to make up roads it may be possible to introduce surface drains leading into soakage pits. This could reduce mosquito breeding and help to avoid epidemics of cholera or typhoid as well as other water-borne diseases, and at the same time improve amenities and make easier the access of motor vehicles especially ambulances, refuse collection trucks and pit exhausters.

2.(b) Water and Washing .

Reviewing studies of the links between water supply improvement and health benefits McJunkin concludes;

"There is a health impact where safe water is readily accessible in adequate quantities - 40 to 60 litres per person per day."

"Health impacts improve as water supplies move from a central well or stand pipes, to yard patios, to house connections".

"Complimentary activities in sanitary excreta disposal and hygiene education incrementally assist impacts".

The goal is clear: adequate safe water for all at an affordable cost with supply as near to the home as possible, but the problems in attaining it manifold.

At present supplies are often intermittent and on pipelines into rural areas breakdowns can persist for a month. In the peri-urban areas supplies are inadequate, especially in the hot seasons. To bring supplies to Dago has not proved feasible. Those who can least afford to pay do not have individual connections, have to walk further and pay more for the small quantities they can afford which are insufficient for family health. Constrained by these adverse circumstances many resort to traditional and - with population growth - increasingly unsafe sources.

To secure even modest health benefits water needs to be produced and conveyed to families at the minimum cost so that it is readily accessible and sold at the lowest possible price. Large consumers should, by upward scaled tariffs, subsidize small consumers. Urban land-owners should be under an obligation to install individual connections on each plot but free to do as much of the installation work as they wish to reduce costs. Groups of householders should be encouraged to enter into contracts with the supplying agency (the Municipality) to pay charges based upon the reading of a single meter. The basic quantity needed by each family should incur a flat rate charge with an additional charge levied only each half-year if that quantity is exceeded. Payment should be made as easy and non-time-consuming as possible. In rural areas group contracts, to include installation of branch pipelines, should be encouraged. Such groups have then a strong interest in safeguarding their part of the reticulation to reduce leaks and breakdowns.

Wash houses should be planned with latrine improvement programmes and promoted through hygiene education. Disposal of sullage, though, should not - as mentioned earlier - be automatically into latrine pits.

## 2(c) Health and hygiene awareness in Kisumu

The survey shows that not only are people in Kisumu interested in their health they are also prepared to work to improve their environment for better health. The striking deficiency is their knowledge of what they can, in fact, do. Overwhelmingly people want latrines but very few of them know why latrines are needed for disease control. They want latrines because to have one is "usual" or "normal" or "to control flies" - though hardly one house surveyed had a satisfactory latrine cover. They are mostly not aware of the danger of uncovered faeces, especially in a damp climate area. People want cheap, easily available water and are prepared to pay to secure it. They do not, though, understand disease transmission through polluted water. Very few are aware that water can be contaminated in the home.

They want better health but because they have vague and unsatisfactory concepts - or no concept at all - of the causes or transmission routes of disease, they are "in-the-dark" having no concept of prevention. Those responses to questions about prevention which amount to "go to a doctor or a clinic and receive or buy tablets" show both ignorance and vulnerability.

To discuss the origins of the wide gap between the knowledge of prevention of health professionals and the ignorance of people generally - despite people's exposure to formal education - would, though instructive, divert us from practical considerations. If there is to be substantial health improvement; if substantial benefits are to be obtained from investments in better water supplies and sanitary provision the ignorance gap, must be reduced. Recent changes in Kenya school education will help but only in half a generation. The gap needs to be closed quickly, which requires community education focussed on health and disease and their relation to the habits of individuals and families and also to the environment.



At present, apart from the messages disseminated by the mass media - especially the radio (Kisumu has no television reception) the only source of information on health for the majority is the Chief's or Assistant Chiefs'"baraza" (community meeting). Attendance at such meetings is greater in rural areas. In peri-urban areas frequently few, especially few heads of families, attend. The address given is usually about activities needed for development and raising funds for these through "harambee" (community) contributions. Government policies are promulgated, explained and defended. Health is sometimes the topic but the message is more instructive than informative. The response varies.

In Kajulu Location the Aga Khan Health Services staff are in the early stages of a well-conceived scheme of community education. This will form the foundation for community action on issues such as better hygiene, child care and nutrition, etc. The scheme is based on programmes in rural areas with community-selected volunteers participating in short training programmes and then as "Community Health Workers" disseminating this information to community groups to encourage systematic community action. More progress has been made in the one rural and detached sub-location of Kajulu, Got Nyabondo.

In Manyatta and Nyalenda the Kisumu "Housing Development Division", (with K.F.W. funding and World Bank assistance) has been promoting health awareness and the V.I.P. latrine programme (see Appendix 1), counselling mothers at child welfare clinics, using traditional songs, role playing, demonstrations and plays. The programme is new and no assessment, other than that contained in the V.I.P. latrine report, has yet been made.

The Public Health Department of the Municipality is keenly aware of the need for community health education but with heavy involvement in work on the obvious environmental deficiencies it has limited resources for health education.

Increasing pressure on the clinics led to an attempt three years ago to secure an establishment post of a Health Education Officer. This was approved by the Council but struck out - probably on financial grounds - by the Ministry of Local Government. The P.H.D. would like a well staffed health education section with a budget sufficient to permit an effective programme, the programme to include up-training in their health education responsibilities of all appropriate cadres of Municipal staff.

At present some assistance - mostly of an advisory nature - is received from the Provincial Health Education staff but this will be further reduced as the "District focus" programme is implemented, draining provincial staff resources.

Numerous women's groups within the municipality have been listed. At one time these groups were thought to number 600 but it is likely that no more than 300 are at all active at present. Groups commence a project but as they encounter problems only continue if outside funds flow in to enable them to succeed.

Working with women's groups on a continuing basis requires special skills and experience. To build a satisfactory relationship using a step-by-step approach takes time. Successful women's groups - there are many hundreds, perhaps thousands in Kenya - move from one project to another involving their menfolk as this seems desirable. Very substantial results have been and can be accomplished if the full co-operation of women's groups can be enlisted.

Community health education can be surprisingly productive if it is efficiently and resourcefully organised.

### 3. Choosing priorities in a water/sanitation programme

A successful water and sanitation programme must be built with people. It will involve their participation; be based upon their skills and ability to maintain or to secure the maintenance of all equipment and facilities; it will be affordable by the participants; it will be initiated so that it is seen by them as their programme so that they identify with the methods and goals.

This lesson is not easily learnt by experts who see how community provision is arranged in high-income societies. Failure to learn this lesson has led to many failures.

The survey results reinforce the view that the same scheme will not fit families in low-cash-flow rural societies e.g. Kanyawegi, and families living in high density, wage and non-formal employment urban areas e.g. Nyalenda. The technology must fit the society.

Arnold Pacey in "Sanitation in Developing Countries" (Wiley, London, for Oxfam and Ross Institute, 1977. p.224) states:

"Even in the absence of sanitation technology the crudest of techniques combined with appropriate behaviour patterns can safeguard health to a surprising extent". High density of occupation, though makes, firstly, for more hazards in daily life and, secondly, demands more resourceful use of space. A third point is that people will welcome and use effectively a level of technology that they can understand and feel is appropriate. Lastly, a great deal of persuasion is essential to get people to put a lot of effort into additional daily chores.

A balance must be struck between the technology a society can understand, afford and maintain, and also that level of technology that will bring optimum health benefits. Safe

water available in the house at the turn of a tap brings the maximum health benefits. Each step away from that technology needs, as a compliment, more understanding, more involvement and commitment on the part of "consumers" to optimise health benefits. So also with flush toilets and water borne sewerage.

The priority then, is an intimate knowledge (approaching an insider's view) of the society, its beliefs, attitudes, habits and resources so that together the outsider and the "consumers" can build an appropriate scheme.

#### 4. RECOMMENDATIONS

1. In Manyatta and Nyalenda the V.I.P. latrine programme and with it the activities of the Housing Development Division of Kisumu Municipality need broadening into an environmental improvement programme.
2. In such a programme the Municipal Public Health Department and especially the Communicable Disease Control Division have an important part to play. They need a post of a Health Education Officer at Grade 4 with an Assistant Health Education Officer and supporting staff and transport, and also a budget to enable the Department to organise programmes and to conduct staff training and community sensitization.
3. The programme should be a "rolling programme" concentrating initially on a specific area and precise measurable goals. A Steering Committee should control project funds - not though basic staffing and support provision - and should be composed of P.H.D. and HDD staff members with Aga Khan Health Services representatives and an expert (consultant) to monitor progress. The Steering Committee should work through an Executive Committee meeting monthly.
4. An additional responsibility of the Project Steering Committee should be to arrange for professional advice on socio-cultural aspects of programmes for those responsible for any developments in water and sanitation plans involving particular communities. The P.S.C. should also be able to arrange for surveys and enquiries in local communities to strengthen the planning and execution of schemes by securing local participation.
5. The bodies participating in the project through the Steering Committee should be encouraged, by funding and expert advice, to produce educational materials for use by the programme.

WAPENJO JI PII MA GITIYOGO E UTEGI, TO GI KUONDE MA JI GO YUDORE E. WAKWAYO IYIE IKONYWA GIDUOKO PENJO MA WABIRO PENJI, DUOKO MARU BIRO KONYOWA INONO YA MA PII NYALO CHOPONIGO MACHIEGNI:

1.1. Eodu ka uyudo pii kanye ma ukonyorego? .....

1.2. Obor maromo nadi gi ot kama udakieye ni? Dohed ondamo adi kata mael (Mile) adi? .....

1.3. Kauomo pii kamauyudeno to kawou seche adi? Dakika ..... Sache gi dakika .....

\* Only for those getting water from a pipe or Tap.

2.1. Pigni Uchule? ..... Uchulo pesa adi kuom debe, kata ndowo? (Kube) .....

2.2. Bende nitie seche mapi bedoe maonge efureji? ..... Nyalo kawo ndalo adi ka ongee pii machwer efureji, .....

2.3. Uyudo pii kanye ka pi orumo efureji kama uumbee? .....

\* Only for those getting Water from a Stream Pond e.t.c.)

2.1. Pii nyalo yudore ei dago, yawo, aora kata soko ma umboeno higa duto ma ok orumo? ..... To ka pii oduono kanyo to uyudo pii kanye.

2.2. Pi ma utiyogo mawuok eyao, aora kata edago, inyalo wacho ni ober? ..... Ango ma omiyo diwach ni ober? Kata ere kaka dinge ni pii ma wuok ka kamao ber? .....

Ango ma omiyo orach? .....

3.1

Pi mane ma ber ma oloyo moko duto e gweng'u ka? .....

Lumbe kanye? .....

Ere gima oniyoo oberyee ma oloyo pi mayudore kuonde ma pi moko yudoree egweng'ka? .....

3.2

Nitie gima itime pi mondo imed lose obediyeer maler ka isekelo ei ot? .....

3.3

Ere kaka ngato nyalo chide kata duwe .....

3.4

Tuoche mage ma ngato nyalo yudo kuom pi ma ochido kata maricho? .....

3.5

Iparo ni inyalo chulo pi ka okelni pii maler kendo mangeny? .....

Ango ma inyalo chulo e Debe ka Debe mar pi? .....

Kelo pi maler tiende ni pi biro bedo mangeny kata fureji ichungoni ei dala. ....

4.1.

Higni apar ma okalo sirikal nogolochik ni nyaka ngato ka ngato kuny choo ma ger, kaluore gi chik mane ogol no bende ne igero choo? To ingi choo esani? .....

Choo maingoni nogere higni adi mokalo? .....

4.2

Ne iloso choo nini karango kene okethore? Dueche adi mosekalo. ....  
Higini adi mosekalo .....

4.3

Ji adi kuom joot ka matiyo gi choo ni? .....

To adi ma ok ti kode .....

Ask their relationship to the respondent? .....

- 4.4. Iparo niji duto onego obed gi choo? .....
- Ango ma omiyo ber ka ngato nigi choo? .....

\* Look at the Latrine and describe

- (a) Roof .....
- (b) Walls .....
- (c) Slab .....
- (d) Cleanliness .....
- (e) Use .....

- 4.5. Di yie chulo pesa ka oholi mondo ibed gi choo ma oger kaka chik d'waro?

Di chul pesa adi edwe ka dweka ogerni choo e gowi? .....

- 5.1 Nitie ngama tuo eoudu kani sani? .....

Di nge tuo matuoye?

- 5.2. Bende nga'to osetuore eot ka chakre christmas? .....

Tuo mage mane tuoyegi?

- 1. ....
- 2. ....
- 3. ....
- 4. ....
- 5. ....

- 5.3. Ango ma iparo ni kelo tucche gi? .....