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A SOCIOLOGICAL STUDY OF RURAL WATER USE

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Project Report

For

GHANA WATER AND SEWERAGE CORPORATION
RURAL WATER SUPPLY AND ENVIRONMENTAL
HEALTH

By

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CHAPTER I

I. INTRODUCTION: Rural Water Supply and Environmental Health Project in Ghana is preparing a 15 year development programme for supplying drinking water to rural areas in Ghana. For this reason the organisation commissioned us to undertake an empirical research to study selected rural communities in order to discover some of the existing socio-cultural factors which may have relevance to water usage and in supplying drinking water to rural Ghana. It was also necessary to determine some of the existing traditional habits and practices with regard to rural water use. For these reasons the following objectives were set out to guide the focus of the study.

II. Objectives of the Study:

1. To determine some of the existing socio-cultural factors affecting the use of water.
2. To determine the type of participation community members may wish to give in maintaining modern water supply.
3. To estimate the ability and willingness of rural population to pay for drinking water.
4. To find out some of the cultural habits of the people, with regard to water use.
5. To give a sociological comparison between traditional and modern modes of rural water use.

III. Study Areas: Six communities were selected from three main geographical cum cultural areas in Ghana. In each selected area, one village with modern water supply and another village which still uses traditional modes of water supply were included in the study. The inherent objective was to offer bases for comparative analysis.

The specific selected communities were the following:

1. Adubiase (in the Eastern Region near Akim Oda; it has no modern water supply. Originally the plan was to study Adwobue in the same region but due to time constraint we were unable to study this community. We substituted a similar community in the same region. We hope that in a follow up study we shall study Adwobue.)

2. Bososo (in the Eastern Region; it has a modern water supply.)
 3. Kofiase (in Ashanti Region; it has no modern water supply.)
 4. Nsuta (in Ashanti Region; it has a modern water supply.)
 5. Bonyanto (in the Northern Region; it is without a modern water supply.)
 6. Kanvili (in the Northern Region; it has a modern water supply.)
- Table 1.1, gives us an insight into the population figures and the sample figures.

Table 1.1

Data on Project Areas and on Respondents

Region	Project Area	Town/Village	Population	No of Respondents
Northern	III	Bonyanto	340	171
		Kanvili*	1096	302
Ashanti	II	Kofiase	2980	584
		Nsuta*	2713	510
Eastern	I	Adubiase	1113	401
		Bososo*	2459	292
Total of Respondents			9701	2260

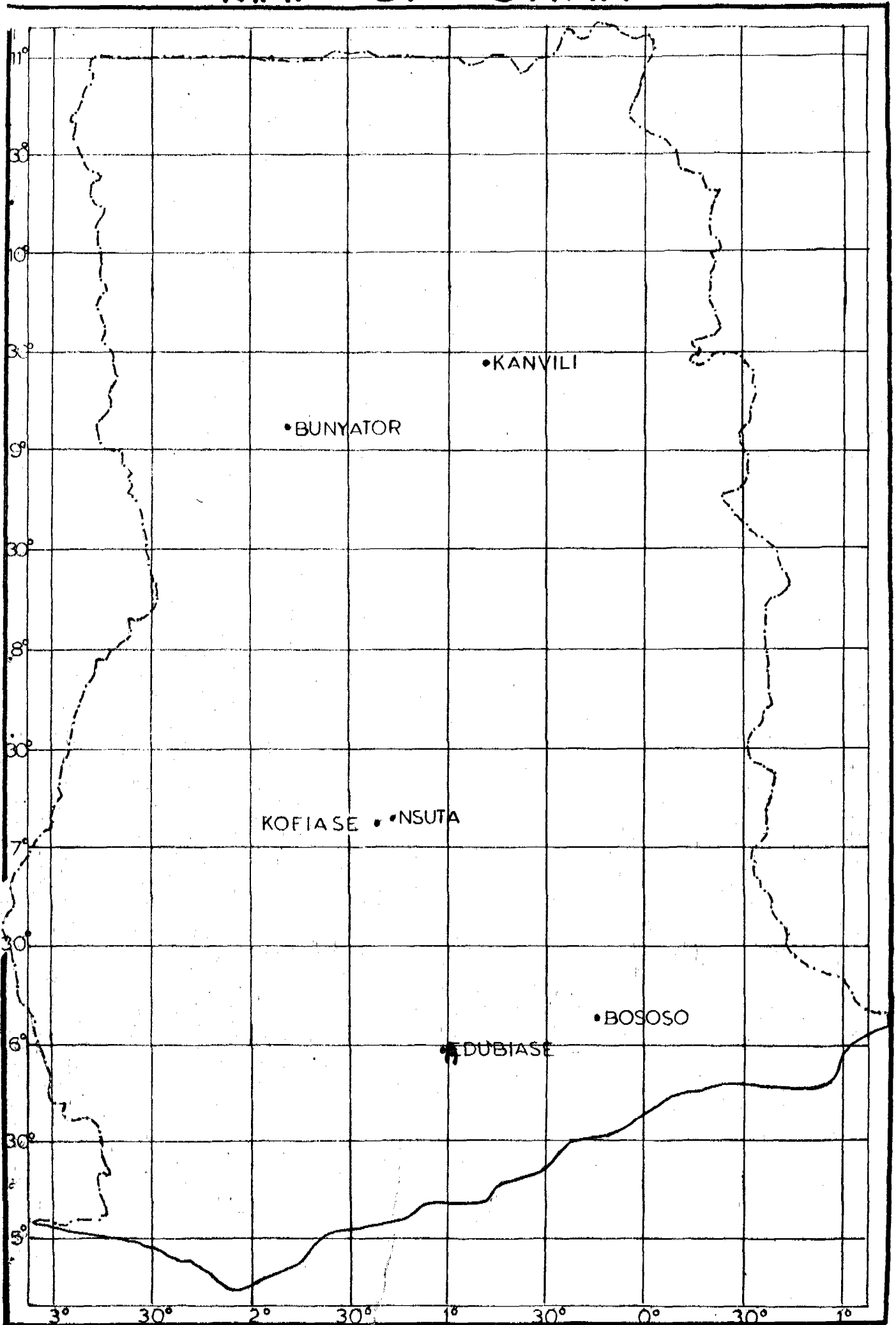
Notes: *1 Communities with modern system of Water Supply.

2. Estimates based on 1970 Population Census.

IV. Description of the Selected Communities

- A. Adubiase: - Adubiase is a small sized village in the Eastern Region in Ghana. It is about 14 miles from Akin Oda, one of the principal towns, in the Eastern Region. According to the 1970 population census figures, there were 1113 inhabitants, made up of 535 males and 578 females. Majority of the people were found to be within the young age group, between 0-45 years of age. Basically, Adubiase

MAP OF GHANA



is an agricultural Settlement. Many of its inhabitants are engaged in cash crop farming. As it is a common practice in farming communities, many of the adult population were usually found to be absent from their houses in their farms during the best parts of the day. They usually return to their homes in the late evenings. In this village there is an elementary school. There is also a post office and a police station. In this community we found few clerks and other administrators working in the ~~few government agencies~~. They were found to exert considerable influence in the deliberations of community affairs. As there was no pipe borne water, these clerks were of the opinion that the community was not healthy, because they were drinking impure water. According to them, many of their ills were caused by drinking from the existing traditional source.

All community members gave us their cooperation in the hope that they would get pipe borne water. The chief of the village for example beat the gong gong and gathered his elders and people around to inform them about our presence. He asked them to cooperate with us because they would find the project to be a useful one. He allowed our field workers to use the facilities of his household. In the final stage of the field work, he asked us to inform the Water and Sewerage Corporation not to hesitate to bring them clean pipe borne water.

- B. Bososo: Bososo is about 60 kilometers from Accra. It lies on the main Accra-Kumasi railway line. At one time, it was a flourishing cocoa buying centre and for this reason the town is fairly heterogenous in terms of its ethnic composition. Essentially, however, it remains an Akan town. The inhabitants are mainly Akan speaking. It is situated in the Eastern Region. The 1970 population census reveals a population statistics of 2459 people, made up of 1223 male and 1236 females. The occupational structure shows that many of the inhabitants were self-employed, in farming, fishing and timber marketing. A few were

engaged in clerical work, administrative, trading and other commercial activities. Again, most of our respondents were very much interested in the survey in the hope that the water supply situation would be improved. Already there is a modern system of water supply. Infact there were standing pipes; but many of the inhabitants complained about the irregularity and malfunctioning of the water supply system. For this reason, many of the inhabitants use both modern and traditional modes of water supply to meet with their daily water requirements. We were informed by many of the respondents that Bilharzia was a common disease contracted through the traditional mode of water supply. Our investigation showed that the two streams, Yava and Buso which form the main source of traditional water supply infact are Bilharzia infected. The inhabitants use these sources to collect water for household consumption. Children usually swim and drink from these streams, from where they get in contact with the organism. The streams, we were told, were full of the schistosoma eggs. Many parents confirmed that many of their children have suffered from bilharzia.

It must be remembered in this regard, that in name, Bososo has a modern medium of water supply yet in practice all its inhabitants relied on the traditional mode because the modern pipe borne system was unreliable and usually out of order. The inhabitants were really dissatisfied with the pipe borne system, because it was not giving them the desired regular service. Also they opined that many villages around them ~~thought that Bososo was well off with clean pipe borne water supply~~ but infact they have to meet their water requirements from the existing traditional source, which was Bilharzia infected.

C. Kofiase: This community is in the Ashanti Region. It is a small but prosperous village with a population of about 2980 people. The village is situated on the North Western part of Asante Mampong, on the Tamale Road. Infact it is about nine miles from Asante Mampong.

Many of the inhabitants, almost all, are peasant farmers. Their farms are about two to three miles away from the village. Some of the farm produce include, plantains, cocoyams, maize, cocoa and other related cash crops. In the field of education, there are three middle and five primary schools. Also there are many Christian Churches operating in this community: the Seven Day Adventist, the Methodist and Presbyterian Churches were popular ones.

There is no modern water supply; the inhabitants collect water for their daily use from a nearby small river. An elder of the village informed us that of the most important items in life (water, air and food) water is of great value in helping them to lower constant ills and infections.

Their main source of water supply is from a small river by name "Odommohoro". During the dry season, this river dries up; it gets easily polluted also during the rainy season. It was repeated over and over again, by the people, that they desire modern water supply. Infact when one examines the process by which the inhabitants collect, store and use water, one would agree that there is an urgent need to supply them with modern pipe borne system.

D. Nsuta: It is an ancient Ashanti town. It is about four miles from Ashanti Mampong. The inhabitants are mainly farmers but there are pockets of other clerical workers in town who work in such areas as Postal services, Local administration and extension agriculture.

According to the 1970 census figures, there were 2713 people found in this locality. Of this number 1292 were males and 1421 were females. As found in many parts of Ghana and in the

developing parts of the world, many of the inhabitants were in the young age group.

In this town, there is a modern pipe borne system. However, as indicated repeatedly by many of the inhabitants, this system of water supply was found to be unreliable at times.

There were frequent stoppage of flow, irregular hours of supply, and at times, due to the low pressure system, the water does not flow with normal strength. For these reasons the inhabitants supplement their water usage from nearby streams.

E. Bonyanto: Originally, we decided to study Larabanga in the Damongo district. Due to lack of cooperation from the inhabitants of Larabanga we selected Bonyanto for our study. When the Principal Investigator arrived at Larabanga, he had a meeting with the chief and his elders of the village, who were very favourably disposed to the study and promised their full cooperation. Additionally, a tour was made of the village and its surroundings with the view of familiarising the research fellow with the general conditions that then prevailed. Two teachers, natives of the village were then selected and trained to do effective interviewing and fill the questionnaires; and the research fellow actually observed their first few interviews. Soon after the departure of the research fellow, villagers were warned by one of the influential elders not to cooperate with the two research assistants. As subsequent efforts to obtain cooperation failed, the research fellow selected Bonyanto a neighbouring village with largely identical socio-cultural setting, as an alternative target population for study.

Bonyanto, a wayside village, is situated on the Tamale-Saula road in the Northern Region. It is 64 miles from Tamale and 8 miles from Damongo, the nearest urban area. Bonyanto is a rural community, it has no pipe borne water supply. Subsistence farming is the major occupation. Excess food supplies, however, are marketed daily, along the road side, and on the weekly Saturday markets at Damongo. Farm lands are not distant from

the village. Maize, yams, millet and, to a lesser extent, rice, are the major cultivated crops. Livestock include cows, goats and sheep. The villagers also engage in small scale poultry farming. The village is served by one (Presbyterian) primary school. A seasonal dam also serves as a source of water supply during the rainy season only. The only other source of dry season water is a shallow stream five miles away. At one of the periods of the research, a woman complained that she left home at about 3.00 a.m. to fetch water but returned from the stream around 8.00 a.m. This illustrates some of the main difficulties encountered by the villagers in relying on traditional source of water supply. Also the high prevalence and incidence of guinea worm and stomach diseases testify to the unhygienic nature of the water.

It is also interesting to note that the day preceding one of the visits, the inhabitants, in their desperation for good water supply, had pooled together an amount of ₵1000.00 (one thousand cedis) which they deposited with the District Chief Executive at Damongo. Furthermore the chief and village elders and the younger generation of men and women showed very keen interest in the study; they were very cooperative and expressed the desire and hope that the study would result in a concrete response to their dire need for modern water supply.

The statistics of the 1970 population census show that there were 340 inhabitants in this village, made up of 174 males and 166 females. Children and young adults form the bulk of the people in the village.

F. Kanvili: Kanvili is in the Northern Region. It is a wayside village which lies on the Tamale-Bolgatanga Road. It is three miles distant from Tamale and an equal distance from the Kamina Barracks. As such, it appears to be well located for commercial purposes and activities.

Kanvili has pipe-borne water supply. There are five different pipes installed in different sectors of the village. However, hygienic conditions surrounding the pipes need much improvement. The village has a primary and middle school. It is also served by a health clinic manned by community health nurses who visit the village twice weekly to deliver health care services, antenatal and general health education.

Kanvili, a fast growing village, is teeming with a large population of youngsters who organize themselves for competitive sports and communal self-help projects. There are rich human resources waiting to be tapped effectively.

Occupationally, the villagers are engaged mainly in subsistence farming. However, quite a number of the young men are engaged in clerical jobs in Tamale. It is of interest to note that one of the inhabitants is large scale rice farmer who uses modern farming methods for increased output. A few dry season gardens exist. These are scattered around the areas where the pipes have been installed. Because of its strategic geographic position (situated as it is between Tamale and the army barracks), Kanvili has an easy access to markets. Commercially, it is strategically placed and can easily develop into a centre for gainful transaction in food products.

There are 1096 people in this community, made up of 549 males and 547 females. As usual the population statistics show clearly that children and young adults predominate.

TABLE 1.2: AGE STRUCTURE IN THE SELECTED SIX COMMUNITIES

LOCALITY		SEX	AGE (IN YEARS)								
			ALL AGES	BELOW 1 YEAR	1 - 4	5 - 9	10 - 14	15 - 24	25 - 44	45 - 64	65 AND OVER
1. KOFLASE	1970	M	1494	62	267	283	216	240	240	117	69
		F	1486	68	209	246	226	234	314	116	73
	1960	M	1045	51	155	156	116	170	279	86	32
		F	978	49	180	158	95	173	211	79	33
2. NSUTA	1970	M	1292	47	184	227	190	212	274	119	39
		F	1421	58	214	221	194	245	301	133	55
	1960	M	1189	56	163	167	138	214	339	70	42
		F	1096	42	151	185	138	181	238	115	46
3. BOSOSO	1970	M	1223	37	161	203	186	177	260	142	57
		F	1236	41	176	204	169	227	288	89	42
	1960	M	1719	70	223	244	154	325	500	142	61
		F	1401	49	202	222	151	291	351	106	29
4. EDUBIASE	1970	M	535	17	97	95	73	91	81	60	21
		F	578	27	65	97	96	112	107	62	12
	1960	M	545	21	96	82	84	80	122	52	8
		F	546	27	93	95	59	99	132	37	4
5. KANVILI	1970	M	549	17	94	122	59	46	117	52	42
		F	547	20	115	82	27	82	162	40	19
	1960	M	412	9	57	64	54	56	95	64	13
		F	347	12	38	51	20	57	127	40	2
6.	1970	M	174	11	30	26	24	33	33	12	5
		F	166	9	31	18	19	47	30	10	2
	1960	M	Total population for 1960 = 160 (1960 Census volume 1)								
		F									

Source: Ghana Population Census 1970.

TABLE 1.3: ECONOMIC ACTIVITY IN THE SIX COMMUNITIES

LOCALITY ;	SEX	ECONOMIC ACTIVITY						
		TOTAL AGE 15 AND OVER	EMPLOYED		Unemployed	Home Maker	Other	
			TOTAL	In agri- culture hunting forestry and fishing				
1. KOFLASE	1970	M	666	488	336	62	3	113
		F	737	584	515	12	70	71
	1960	M	567	510	351	15	7	42
		F	496	433	396	6	37	20
2. NSUTA	1970	M	644	484	176	40	1	119
		F	734	490	245	31	109	104
	1960	M	665	591	241	26		48
		F	580	521	336	6	24	29
3. BOSOSO	1970	M	636	484	142	60	4	88
		F	646	421	90	50	109	66
	1960	M	1028	917	572	33	3	75
		F	777	595	112	10	127	45
4. EDUBLASE	1970	M	253	199	142	17	29	37
		F	293	239	175	3		22
	1960	M	262	234	170	16	2	10
		F	272	251	176	1	15	5
5. KANVILI	1970	M	257	216	197	5		36
		F	303	10	1	-	268	25
	1960	M	228	170	168	23	2	33
		F	226	73	8	6	131	16
6. BONYANTO	1970	M	83	77	74	1	1	4
		F	89	1	-	-	86	2
	1960	M	Total population for			1960 = 160		
		F	(1960 census volume			1)		

Source: Ghana Population Census 1970.

TABLE 1.4: REGULAR SCHOOL ATTENDANCE BY AGE (IN YEARS)

		REGULAR SCHOOL ATTENDANCE BY AGE (IN YEARS)										
LOCALITY	SEX	TOTAL AGE 6 AND OVER	6 - 14			15 - 24			25 AND OVER			
			NEVER	PAST	PRESENT	NEVER	PAST	PRESENT	NEVER	PAST	PRESENT	
1. KOFIASE	1970	M	1093	89	10	328	39	97	104	307	119	-
		F	1141	65	26	313	113	70	51	464	39	-
	1960	M	807	87	15	138	413	123	31			
		F	716	156	15	49	451	43	2			
2. NSUTA	1970	M	1004	47	4	309	43	68	101	262	170	
		F	1107	48	12	313	76	92	77	419	70	
	1960	M	942	82	16	179	449	185	31			
		F	859	142	11	126	497	71	12			
3. BOSOSO	1970	M	991	60	10	285	23	86	68	262	196	1
		F	975	85	22	222	87	53	336	83		
	1960	M	1374	117	14	215	613	361	54			
		F	1099	167	16	139	650	104	23			
4. EDUBLASE	1970	M	403	20	8	122	18	40	33	94	68	
		F	468	52	16	107	57	40	15	158	23	
	1960	M	414	49	12	91	160	94	8			
		F	401	79	11	39	243	27	2			
5. KANVILI	1970	M	408	120	1	30	38	2	6	210	1	
		F	391	77		11	81	-	1	221		
	1960	M	329	97		4	222	2	4			
		F	286	60			226	-	-			
6. BONYANTO	1970	M	127	28	1	15	30	1	2	47	3	
		F	121	20		12	46	-	1	42		
	1960	M	Total population for 1960 = 160									
		F	(1960 census volume 1)									

Source: Ghana Population Census 1970.

V. Methodology

(A) Sample. A pilot study was undertaken in the Summer of 1976. During this period six communities were selected. The selection criteria were based on the following considerations. Firstly, that the communities must represent rural Ghanaian communities. For this reason the geographical and cultural characteristics of the regions were taken into consideration. Two communities were selected from the Northern Savanna Regional area, two communities were selected from the forest belt area, and the remaining two communities were selected from the Southern regional belt in the Eastern Region. Secondly, it was noted that we need to undertake a comparative study into the habits of people who use traditional modes of water supply and of those who use modern pipe borne system. For this reason, in each selected geographical cum cultural area, two communities were selected, one with and the other without pipe borne system.

After our preliminary determination of the sample areas, we decided to select a representative sample which should form the basis of the enquiry. Furthermore, for the purposes of generalization, it was essential to use the probability sampling technique to determine an acceptable sampling universe. As it were, the essential element in probability sampling technique is to select sampling respondents who can be said to represent meaningfully the existing population universe.

In each community therefore, we gave every individual house an equal chance of being included in the study. The specific sampling scheme we used was the systematic sampling method, with randomization start. That is to say, we counted all the houses in the communities and through the theory of random numbers selected the first house to begin with. In communities with heterogeneous elements and life styles we used a stratification scheme. The differences allowed us to obtain more meaningful information from the diverse population elements. And this method did not in any way contribute to sampling error of the population estimation. It was evident that the differences between

the strata means in the population did not contribute to the sampling error of the estimate of the population mean. Indeed, sampling error of the estimate of the population mean comes only from variations among sampling units that are in the same stratum.

In each of the selected houses, we used all the inmates in the house to form the basis of our sample respondents. In the final analysis, the following table show the number of the respondents who answered our questions.

Table 1.5: The number of respondents in the Study areas.

Name of Village	Household Heads	15+	15 Below	Total
Bonyanto	43	53	75	171
Kanvili	80	102	120	302
Kofiase	136	181	267	584
Nsuta	126	176	208	510
Adubiase	120	130	151	401
Bososo	81	108	103	292
Total	586	750	924	2260

In order to get a representative sample from all the diverse elements within the population structure we decided to sample from below 15 age group, from household heads and from those members of the selected houses who were above the age of 15. Finally 2260 respondents formed the basis of our sample design.

(B) Techniques of Data Collection

We used various methods to collect reliable and valid data. Questionnaire schedules were constructed to form the main basis of data collection procedure. The questions were deduced from the objectives of the study. Other field methods such as observation, unstructured field interviews, and the panel discussion methods were used to help us to "Xray" the social reality and to cross check on the form of the

data in order to improve on the quality of data.

Field interviewers were carefully selected and trained. The questions were discussed with them and translations were made into the appropriate local languages. Essentially, however, the questionnaire format was framed in the English language. And field supervisors were selected from our own experienced University based research assistants. They were distributed to all the study areas. Constant field checks were provided by the Principal Research Investigators.

(c) Rationale for the Study: Many authors have indicated clearly that many of our ills, in the area of infant death rate, general morbidity, and parasitic and infectious diseases especially occurring in rural Ghana, are attributable to lack of sanitary conditions, including untreated water supply. We know that Ghana is essentially a rural community. In statistical sense, the majority of the people live in rural and outlying settlements. In these areas, the existing environmental situation leaves much to be desired (Twumasi 1975). Basic infrastructural facilities are non-existent. The water supply system is mainly of the traditional type. For this reason, many of the rural inhabitants are usually exposed to many sources of infection; and in this relationship children, in the age category of 0-5 bear the blunt of the burden vis-a-vis high death rate (Sai 1972).

It has also been estimated, by medical scientists, that, of the total death rate figures, about 50% of the deaths are from the infant age group. The death rate figures are so high among the very young. As it were, in the rural areas, due to impure drinking water supply, children who have less resistance to infectious and parasitic diseases suffer tremendously from water borne diseases. Sai argues vividly that insanitary conditions, superstition, malnutrition and poor water supply system tend to aggravate rural ills and subsequently we get high mortality rates in all age groups in the rural areas. As a result of lack of clean water supply many diseases tend to spread rather quickly among the rural folks.

It is precisely in this direction that many urban dwellers at times find it very difficult to settle in the rural and outlying settlements in Ghana. Those who have lost their resistance complain about the possibility of contacting infectious and parasitic ailments. Others are afraid to be infected specifically with bilharzia, a common water borne disease.

Medical epidemiologists have also been concerned with the problems of rural water supply. The emerging argument is that in order to cut down on water borne diseases, it is imperative that health planners and health policy makers should concentrate to provide pipe borne water to the rural communities in Ghana.

Schistosomiasis, dysentery, typhoid, to name only a few of the water borne diseases, are prevalent in many parts of the country as a result of insanitation. During epidemics, the spread of diseases take a heavy toll of the population. Due to lack of infrastructural development, the Ghanaian health structure (as argued by Twumasi 1975) adheres mainly to curative measures. Take the case of the hypothetical villager who drinks bilharzia infected water: he contacts the disease, seeks help from an urban hospital. He returns to his original environment to be infected again from poor conditions of living.

For these reasons, it is of crucial importance to build a preventive health structure which would take into consideration the improvement of rural environment. This situation means precisely the provision of clean pipe borne water system in rural Ghana, the building of clean market places and a corresponding cleaning of the gutters. These measures would mean a shift of emphasis from the curative to preventive health structure. It ought to be remembered that in many developed economics, there has been a great preventive emphasis during the 19th century. During the period, under discussion, the water supply system was built. The emphasis was placed on building drainage systems effective water supply systems to encourage the people "to live clean". In terms of cost benefit analysis, many of the infectious and parasitic diseases were firmly brought under control. In other words building of viable water supply system would in the long run be less expensive for the Government in the area of taking ^{care} of the people's

health.

In Easmon's report (1970), a Report of the Committee appointed to investigate the Health needs of Ghana - these observations were made: "one adult in every three, besides an appallingly high number of children, normally died (in 1960) from treatable or preventable conditions. Malaria, hookworm, guinea worm and other sources of diseases account for many of these early deaths". Poor water supply system, in many areas in Ghana, aggravates the state of general malaise. Children between the ages of one and five years old suffer from gastro enteritis as a result of feeding.

The list of these environmental deficiencies itself suggest several remedies which the Easmon report proposes: "more piped water, efforts to encourage doctors to take up preventive work in the field, the importance of health education in the house, impaired training for village health workers". Ministry of Health Report (1974), also, mentions that as far back as 1930, the then Gold Coast Medical Department became aware of the need to build preventive health measures, in order to control many of the infectious and parasitic diseases. An epidemiological organisation was established to determine viable ways and means to combat many infectious ills. In 1948, the organisation became known as the Medical Field Unit. This organisation was ~~created~~ to undertake other related activities. The organisation was based at the headquarters at Kintampo, where it was under the charge of an epidemiologist who was responsible to the Ministry of Health.

The original idea was to study the cause and course of epidemic diseases and to find ways and means to combat many of these ills. The research officers were to make recommendations to the Ministry of Health with respect to improving rural conditions. This was a move in the right direction. However, the original aims and objectives of this organization became ~~clouded~~ in the larger Ministry's responsibilities and duties. It may be ~~said~~ however that the Ministry's health survey activities have been responsible in determining the demographic endemic diseases in the rural areas. For example, the Ministry of Health report 1974 argues that "the distribution of onchocerciasis, bilharziasis and

intestinal parasites is being carefully worked out. This will help in the planning of health priorities; in advising agriculturists in some of the problems of irrigation, etc; in advising social workers in the resettlement of populations, as may be the case, in the Volta lake Basin; and finally, in advising and assuring industrialists intending to start industries about the safety of the siting of industries and the health of their personnel".

The essence of this research therefore is of an immense consideration because before any viable rural water project is embarked upon, it is of paramount importance to determine the Socio-cultural habits of the people, in regard to water use. A report study submitted by Tahal Consulting Engineers Ltd. Tel Aviv, Israel (1977) to the Ghana Water and Sewerage Corporation, Rural Water Supply and Environmental Health Project had this to say: "Like in most developing countries, and particularly those in the tropics, the rural population in Ghana suffers from a larger number of diseases, many of which can be fatal" (see page 104 of the report). It goes on to point out that "The transmission of many of the diseases listed is related to water, and it is generally agreed that an ample supply of good quality water will lead to improved health and bring about economic and social benefits". The report mentions that it is not only through drinking water that people get many of the water borne diseases. That diseases may be contracted through other means such as bathing or washing clothes in polluted waters.

All these related material throw some light on the relevance of this research study. For, many social scientists, doctors, epidemiologists and sanitary engineers agree on the notion that supply of clean pipe borne water is of considerable importance to help reduce mortality and morbidity rates. For this reason we need to know, with the supporting facts and figures, some of the socio-cultural habits of the people.

CHAPTER 2

CHILDRENS' VIEWS REGARDING WATER USE

I. Introduction

In the various communities, children were asked to express their views on how they use water and we were interested to determine their habits in this regard. Before we discuss these issues, we shall describe the social background characteristics of the children then discuss their views and habits with regard to water use.

II. Social Characteristics of children at Adubiase

There were 151 respondents interviewed at Adubiase. Out of this sample, 53% of them were girls below the age of 15 years. The remaining 47% of them were boys of similar age group.

Table 2.1 Distribution by sex of children at Adubiase

Sex	Frequency	Percentage
Male	71	47.0
Female	80	53.0
Not stated	-	-
Total	151	100.0

The sample was estimated through the probability sample theory. This shows that there were more females than males in the community. Infact it reflects the true sex ratio relationship in the community. For example, in the 1970 population census there were 578 females and 535 males in the community.

The children who were within school going age were asked to indicate whether they were in school and if so which grade of schooling have they attained. As indicated in the Table, 47.7% have received or are receiving some form of literate education.

Table 2.2 Distribution by Education of Respondent

Education	Frequency	Percentage
Literate	72	47.7
Illiterate	78	51.7
Not stated	1	0.6
Total	151	100.0

However a significant percentage of them (51.7%) have had no formal education. Adubiase it must be noted lies several miles from Akin Oda. It is an isolated farming community. The only available primary school is poorly staffed with teachers and it was discovered through the interviews that physical facilities were limited. And for these reasons, it was not surprising that many of the little children were not in school. Of those who have received some form of formal education, many of them reached only 6 years of primary education.

Many of the children usually help their parents on the farms and participate actively in the various household duties. Only an insignificant minority of them were working on their own (1.3%). In other words, children under the age of 15 were infact under the financial care and protection of their parents. They are under age and have not

Table 2.3 Distribution by category of Work

Category of work	Frequency	Percentage
Employee	-	-
Self-Employed	2	1.3
Not Applicable	120	79.5
Not stated	29	19.2
Total	151	100.0

yet assumed adult roles and responsibilities. They were not expected to act like adults, they have no private source of income, were not expected to be married and in short their life styles were an extension of their parents' own life styles and aspirations.

III. Water Use: Views and Habits

As stated earlier, children play an important role in maintaining their parents' households. They were found to assist their parents on their farms, in cleaning their various households and they went daily, sometimes twice daily, to the nearby river to fetch water for household use.

In terms of water usage, children in this community played an important role. Everyday observation showed that many of the children (within the age group of 7 to 14) were saddled with this duty. They woke up early in the morning, around 5.30 a.m. to begin to go to the river side to carry water. Various utensils were used but prominent among them were buckets, empty kerosene tins and small barrels of various sizes and shapes. One child was observed to carry about three tins of water during each morning session. This exercise took place within a two hour period, i.e. from 5.30 a.m. till 7.30 a.m.; it is a distance of about 2 kilometers away. It is usually a cumbersome and time wasting exercise. At times, the children were found to be engaged in endless arguments and fights. The causes of these misunderstandings stem from the fact that it was at times difficult to determine who arrived at the scene first and whose turn it was to use the particular can to fetch water from the river. When they return from the river, they emptied the water into a larger basin, a big barrel or a tank.

These containers usually contain about 12 tins of water. So in an average household, four children could easily fill the tank or barrel during the morning 2 hour period, by going three times each to fetch water. It contains 30 gallons of water. We discussed with the children to inform us on the uses of water in their households. Water stored in the barrel is shared with other members in their households; it^{is} used for the following purposes; drinking, bathing, washing and cooking purposes. As indicated in the preceding table, drinking featured prominently.

Children between the ages of 7 to 14 years of age were found to have their bath at the back of their houses. They were not allowed to take water from the barrel containers for their bath. It meant that they had to carry one extra bucket of water to be used for their bath. Very few of them took their bath at the riverside. Infact, it was against the established rules for children to wash and to bathe in the river. They were however allowed to bathe and to wash their clothes at a place near the riverside set aside for these purposes. This arrangement explains the reason why drinking takes prominence over the other uses of water. Only adults were allowed to use the stored water for the purposes of drinking, bathing, washing and cooking. The very young ones were looked after by their mothers (those within the ages of 0-6), in terms of bathing, feeding and washing.

Table 2.4 Uses of Water as specified by children

	Frequency	Percentage
Drinking	103	68.2
Cooking	10	6.6
Washing	10	6.7
Bathing	26	17.2
Construction	-	-
For animals, birds	-	-
Other uses	-	-
Not stated	2	1.3
Total	151	100.0

In all the households, the children indicated categorically that water which they helped to store, was used for drinking, bathing, washing and cooking. These four main areas may vary from household to household in terms of priority: during the washing days more water is needed. In some households, the inmates prefer to wash their clothes in their houses. Usually, the old people, according to the children preferred to wash their clothes in their own homes. The young adult population were found to wash by the river side (at a specific spot set aside by convention).

In addition to the collection of water from the river side, water was obtained from rain water during the rainy season.

Table 2.5 Where do you also get water from

Source of Collection	Frequency	Percentage
Rain/stream/River	149	98.7
Pipe borne	-	-
Both of the above	-	-
Other source	-	-
Not stated	2	1.3
Total	151	100.0

Returning to main source of water collection, for household use, the children indicated that at times other people helped them to collect water. Their mothers and other grown up sisters joined them to carry water for household use. Whenever the household water storage level reaches a low level, these people joined in the exercise. It was also observed that during washing days, many of the people mentioned above joined the usual children to fetch water for washing purposes.

Any time the grown ups were around at the river side, the observation was that they helped to impose order on the procedure used to fetch water. They dug a place, in a form of a small dam. In this place an adult stood to assist the children to fill their utensils, in an orderly fashion. This procedure saved a lot of petty problems of quarrelling and the nursing of grievances in the collection of water. Left to the children alone, much time was wasted and in addition the play element was present.

Turning to specific habit, the observation was majority of the children had their bath twice daily. Only 21.9% of them indicated that they bathed only once in a day. It was interesting to observe that those who were in school had the tendency to take their bath twice within the day. The reason was that they were usually expected to have their bath before they entered the school. Therefore after the morning household activities, they took their bath; and in the evening after school, after they have completed another session of household activities, they were seen to take their bath. On the other hand, those who were illiterates performed different set of activities. They went to farm with their parents. Infact going to farm in the morning did not require such functionaries to take their bath before they embarked on such activities. It was institutionally

recognised that on returning from the farms parents advised their wards to take their bath. So there is a clear difference in the style of life of these two groups of children, in terms of how they use water. Those who go through some form of formal education have the tendency to use more water than those whose primary occupation was that of going to farm.

Table 2.6 Distribution by How often respondents take their bath

How often	Frequency	Percentage
Once	33	21.9%
Twice a day	117	77.4%
1 in 3 days	-	-
1 in 2 days	-	-
Not stated	1	0.7
Total	151	100.0

As the above table indicates the usual practice among rural children is to take their bath regularly and in an enclosed space specially provided by the household head for this purpose. The space is not actually a traditional bathroom. Rather it is a space temporary found or modified by adults for the use of children to provide them with a form of privacy. Girls were encouraged to take their bath in a specially provided sheltered space inside the house. Many boys however were seen to use the open space just like the children for the purposes of having their bath. One important observation was that children were not usually allowed

Table 2.7 Where respondents usually take their bath

Place	Frequency	Percentage
Bathroom	3	2.0
Open space	69	45.7
Enclosure without roof	79	52.3
Not stated	-	-
Total	151	100.0

to take their bath in the same place like the adult. The well-built bathroom was usually reserved for adults only. In terms of water use, each child, of an average age of about 7 years, uses about one bucket full of water a day (a bucket contains about 3 gallons of water) and an adult uses about 6 gallons a day.

The children were told very often by adults, not to use water unnecessarily, that is to say, they were constantly reminded to be economical and not to waste water. As it is a difficult exercise for them to fetch water constantly, it was interesting to note that the children listened to the advice, and for this reason, water stored in the household was carefully rationed and used mainly for the purposes of drinking, washing plates, bathing and cooking purposes. It was only during special washing days that water is freely used in the households. The special washing days ^{are} on Tuesdays and Sundays.

Aubiase children are socialized by their family members to observe the norms of existing cultural practices. For this reason, it was observed that they adhered to rigid discipline, in their day to day usage of storage water. On the average, each child, below the age of 15 years used about 3 gallons of water a day, for purposes of bathing and drinking. The social characteristics of the children also showed that the majority of them were illiterates and in a comparative sense, it was noted that the literate children use more water because they were expected to take their bath in the mornings and evenings.

IV. Social Characteristics of Children at Bososo

In Bososo 103 children, under the age of 15 years were interviewed to find their views and habits with respect to water use. Within the total sample, 51.5% were males and 48.5% were females. The male-female sex differential rate is not significantly different from the 1970 population census statistics.

There were more literates than illiterates. Infact 88.3% of them were receiving or have received some form of formal education. As we discussed in the introductory chapter, Bososo is an old cocoa trading centre, a semi-urban area. For this reason, it has a history of many schools to cater for the sons and daughters of the inhabitants in this town.

Table 2.8 Education of respondents

Education	Frequency	Percentage
Literate	91	88.3
Illiterate	12	11.7
Not stated	-	-
Total	103	100.0

Many of them were Christians and only 17.4% of them were found to be Moslems. As children, they follow the religious persuasions of their parents. So the following religious variants reflect the religious denominations of their parents.

Table 2.9 Distribution by Religion

Religion	Frequency	Percentage
Catholic	4	3.9
Presbyterian	42	40.8
Anglican	5	4.9
Methodist	16	15.5
Moslem	18	17.4
Seven Day Adventist	1	1.0
Other Specify	16	15.5
Not stated	1	1.0
Total	103	100.0

None of the children were found in any gainful employment. They usually help their parents in carrying out household duties. In their various households, the common duties performed by them were fetching water for household use, sweeping their compounds, assisting on the farms over the weekend, and assisting with other routine household duties, as may be determined by the adults and their parents.

V. Water Use: Views and Habits

They were asked to tell us about their views on the uses of water in their various households. They use water for the following purposes: drinking, washing, bathing and cooking (in this order of preference and frequency of usage).

Water is collected by children who are in the age group of 7-14. They collect water mainly from the local rivers. It may be necessary however to remember that there is a modern pipe borne water supply in town but due to its inefficient flow, the inhabitants rely mainly on the traditional source. They collect water from the rivers Yaya and Boso.

Table 2.10 Distribution by water Use

Water Use	Frequency	Percentage
Drinking	53	51.4
Cooking	4	3.9
Washing	33	32.0
Bathing	12	11.7
Construction work	-	-
For animals/birds	-	-
Other	-	-
Total	103	100.0

The situation is similar to that of Adubiase community, in which children are mainly engaged in the exercise of fetching water for household use. As seen in the preceeding table, children form the main bulk of the people whose duty it is to fetch water. (This information was obtained from many of the

Table 2.11 Distribution by who collects water

Type of People	Frequency	Percentage
Self	100	97.1
Mother	-	1.0
Brother/Sister	-	-
Other relative	-	-
Not stated	2	1.9
Total	103	100.0

children and from their parents).

We were also interested to know some of the habits of the children regarding how they use water. In this direction, we were informed by them that they take their bath about twice a day. The majority of them were in school and it is regarded and expected of them to take their bath before they go to school. After school, they continue to perform various household activities, so after the evening work they take their bath again.

Some of them informed us that they at times bathe in the river (from where they fetch their water).

Table 2.12 Distribution by How often one takes his bath

How Often	Frequency	Percentage
Once	33	32.0
Twice a day	68	61.1
1 in 3 days	-	-
1 in 2 days	-	-
Not stated	2	1.9
Total	103	100.0

The very young children are looked after by their parents. For example, the nursing mothers informed us that on the average they use about 2 gallons of water a day to clean their little one, within the age group of 0-2. It was very difficult to determine how many times the very little ones are given their bath. The following description may give us an insight into this norm. Early in the morning, nursing mothers feed and bathe their babies. At times they give them afternoon showers; definitely in the evenings, they bathe their babies, after feeding, to encourage them to sleep. Within the ages of 2 plus to 5 years of age, many of them are bathed once in the evening. If the child had been playing in the mud etc., usually, he is given a bath. But on Sundays all children are expected to bathe and infact are bathed or asked to bathe in the mornings ready to appear in style and to go to church.

At Bososo, unlike Adubiase, many of the children take their bath in a bathroom. This is not surprising because Bososo is a urban town and for this reason many of the houses have built-in bath rooms.

Table 2.13 Distribution by where one takes his bath

Place of Bath	Frequency	Percentage
In a bathroom	81	78.7
Open space	20	19.4
Enclosure without roof	-	-
Not stated	2	1.9
Total	103	100.0

We can say that though Busoso has a modern pipe borne water system yet many of the inhabitants use the traditional source. The reason is that the water from the pipe does not function well, as there is not a sufficient quantity, only the clinic, in town, gets regular supply. People who live near the clinic and of the elite social structure, get water from the piped water at irregular times. In this case, many of them supplement their water requirements by collecting water for bathing and washing purposes, from the traditional source. The traditional source, we were told, is the cause of many infections and parasitic diseases. Prominent among these ills is the Bilharzia disease which is a common malady in this town. It is also important to note that children who get access to use the modern piped water, use more gallons per day, per head, than those who use the traditional source. Wastage element is recognised in the use of modern pipe borne water.

VI. Social Characteristics of children at Nsuta

In order to have a representative view of the different categories of the population, as indicated in the introduction, we broke our sample into two major categories: Household heads, and those below fifteen years of age. Of all the six villages selected, Kofiase happens to be the most heavily populated, followed by Nsuta and this is reflected in the size of the sample. These two villages are in the administrative district of Mampong (Ashanti). Nsuta is about four miles from Mampong while Kofiase is about nine miles lying deep in the forest. Of the five hundred and ten people interviewed at Nsuta, two hundred and eight were made up of people below the age of fifteen years; and out of the (584) five hundred and eighty-four interviewed at Kofiase two hundred and sixty-seven were also below the age of fifteen years. The social characteristics and views of this category of the sample as deduced from their

responses to the questionnaires are given below.

Of the two hundred and eight people interviewed within this category of the population, one hundred and twenty eight (128) i.e. about 61.50% were males. The female population of this sample therefore stood at eighty consisting 38.50% of the sample within this category. One could observe that the males within this sample outnumber their female counterparts by 23%. The difference between the two is quite significant. The reason for this difference could perhaps be a topic of different inquiry.

Table 2.14 Distribution by Sex

Sex	F	% Percentage
Males	128	61.50
Females	80	38.50
Total	208	100.0

Of this sample of two hundred and eight (208) two hundred and seven (207) were literate, in other words there was only one person out of this sample who has had no formal education. One hundred and twenty-four of this sample were either in the primary school or have had education up to the primary school standard. The remaining eighty-two were either in the Middle School or have had education up to the Middle School level. None of these sample of under fifteen years of age was in any educational institution above the Middle School level. One could explain this in terms of the fact that the sample was slightly biased in relation to time. The survey was conducted at the time when pupils were in schools and that pupils in Educational institutions above the Middle School level could not be included in the sample since they would be away from the village in other towns attending school.

They were predominantly Christians. The Christian community consisted 75% of this sample. (See table below).

Table 2.15
Distribution by Religion

Religion	Frequency	%
Christian	156	75.00
Moslem	9	4.30
Other	35	16.80
Traditional	2	1.00
Not stated	6	2.90
Total	208	100.00

One person out of the number was married. This person claimed to be self-employed with an annual income of about one hundred cedis (¢100.00).

VII. Water Use: Views and Habits

Respondents were asked to indicate what they use water for in order of priority. The table below shows the responses of interviewees.

Table 2.16 Uses of Water

Uses	Frequency	%
Drinking	87	42
Cooking	49	23
Washing	37	18
Bathing	35	17
Total	208	100

The table shows clearly the importance attached to water for domestic purposes, particularly human consumption. None of the respondents indicated that water was used for other purposes like construction or for the consumption of even domestic animals. As indicated in the introductory chapter, Nsuta has a modern pipe-borne water supply. But when respondents were asked to indicate their sources of water supply only 20% of the sample indicated that pipe borne water was their only source. As much as 89.9% of the people within this category indicated that they depended on both the pipe-borne and other sources particularly stream. This was explained by the people in terms of unreliability of the pipe-borne as the sole source of water supply. They pointed out that at certain times of the day their supply of water through the pipes is cut off and one has to look for other sources of supply. This creates

a very uncomfortable situation. The research officer in charge of this area ventured to ask people how they felt about this, and it was found that their feelings were essentially negative.

Table 2.17
Source of Water Supply

Source	Frequency	%
Stream	1	0.5
Pipe borne	20	9.6
Both of the above	187	89.9
Other	00	-
Total	208	100.00

The above table shows the peoples responses in terms of their sources of water supply.

Despite the occasional difficulties they encounter with the supply of water, their responses to how often they had their bath showed that they made liberal use of water as compared with other areas where the people have no pipe borne water. The table below shows how often the people had their bath.

Table 2.18
How often bathed

How often	Frequency	Percentage
Once a day	29	13.90
Twice a day	133	64.00
Thrice a day	40	19.20
One in two days	00	00
One in 3 days	6	2.9
Total	208	100.0

More than eighty per cent (80%) of the respondents have their bath more than once a day. This high frequency could be attributed to the relatively reliable source of water supply.

Of the (208) two hundred respondents within this category two hundred and four (204) i.e. about 98% indicated that they have their bath in the bathroom. It is interesting to note that none of the respondents indicated the source of water supply as the place for bathing.

It could be inferred from the above that if there is any pollution of the source of water supply this could not be attributed to the habit of people having their bath at the source of water supply.

Water is collected from the pipe stands by the children using all sorts of utensils including buckets and kerosene tins. Because of the fact that at certain times of the day the water supply is cut off, water is stored mainly in barrels to be used by the household when supply is cut off. It was observed that people get up as early as five o'clock in the morning to go and draw water from the stands. This early rising would not be necessary if water flowed through the pipes the twenty four hours of the day.

VIII. Social Characteristics of children at Kofiase

As indicate in the introduction, Kofiase lies deep in the forest and the people are predominantly farmers - mainly crop farming. It is one of the main sources of food supply to Mampong i.e. the people do not only grow crops for their domestic consumption but have surplus for sale.

A total number of two hundred and sixty-seven people were interviewed within this category. Of the number (144) one hundred and forty-four were females as against (123) males. The female population slightly outnumber the male. In a society where polygamy is practised what one could infer from such figures is that the population is likely to increase quite tremendously in say five years time. This also would imply increased demand for water in the area.

Table 2.19
Distribution by sex

Sex	F	%
Male	123	46.1
Female	144	53.9
Total	267	100.0

Two hundred and twenty-seven of the people interviewed were literate with varying standards of education as against thirty-nine (i.e. 14.6%) who were illiterate. A comparison of this figure with that of Hsuta shows

an interesting difference. Of the total population within this category at Nsuta only one (1) was illiterate. Nsuta is much more urbanised than Kofiase, and since Kofiase is predominantly an agricultural community one would expect that some of the children would follow their parents traditional occupation; so the 14.6% of non-literate children of Kofiase naturally have taken to farming at that age. The data shows that these children obviously are not independent farmers but work with their parents on their farms.

Table 2.20

Distribution by Education

Education	F	%
Literate	227	85.0
illiterate	39	14.6
Not stated	1	0.4

Again none of the children had had education beyond the Middle School level; and this could be explained in terms of biased sampling with reference to time. As mentioned elsewhere the survey was conducted during school session and could therefore not include children in secondary schools and other institutions since such children would be away from home attending school in other towns.

Table 2.21

Distribution by Educational Standard

Standard	Frequency	%
Primary	174	65.2
Middle	53	19.9
Higher institution	0	0.0
Not applicable	38	14.2
Not stated	2	0.7

IX. Water Use: Views and Habits

When respondents were asked to indicate what they use water for in terms of priority, it was found that water was mainly needed for domestic purposes. The table below shows the order of priority.

Table 2.22

Water Usage by Priority

Uses	Frequency	Percentage
Drinking	128	48.0
Bathing	83	31.0
Cooking	36	13.5
Washing	20	7.5
Total	267	100.0

This table seems to indicate the obvious but when one looks at the frequency of use for a purpose like bathing and compare the data with those from an area where they have pipe borne water then something significant and interesting emerges. It may be recalled that Kofiasse does not have modern type of water supply i.e. pipe-borne water. The people depend on only one source i.e. a stream which dries up almost completely during the dry season. Though a large percentage of the people indicated that they needed water for bathing as would be expected in a tropical area but the frequency with which they have their bath would be influenced by their ecology vis-a-vis their source of water supply (see table below).

Table 2.23

Distribution of No. of times respondents
have their bath

How often	Frequency	Percentage
Once a day	234	87.7
Twice a day	26	9.7
Thrice a day	0	0.0
1 in 2 days	0	0
1 in 3 days	5	1.9
Not stated	2	0.7
Total	267	100.0

Though from the Table one could see that bathing is rated next to drinking in terms of importance yet the frequency with which the people have their bath is very low compared with an area where they have pipe borne water. From the Table it could be seen that only 9.7% of the people have their bath more than once a day; to be specific twice a day. At Nsuta which lies only at a distance of twelve miles from Kofiase, and shares common cultural values, 64% of the people have their bath twice a day as against 9.7% at Kofiase. Again at Kofiase 87.7% of the sample have their bath once a day as against 13.90% of Nsuta. While at Kofiase no respondent gave an indication of having his/her bath more than twice a day at Nsuta as much as 19.20% had their bath three times a day. These differences can only reasonably be explained in terms of water supply. People of Kofiase depend on only one source of water supply, a stream which dries up in dry season, and even in non-dry seasons the water is inadequate in coping with the ever-growing population of the village. This inadequate supply of water has tremendous effect on their bathing habits. Unlike Nsuta where the people have pipe-borne water, the people of Kofiase have their bath less often. Even though the people of Nsuta may complain about the unreliability of their source of water supply vis-a-vis the pipe-borne water, because water does not flow through the pipes the twenty-four hours of the day, it could be said that at certain reasonably length hours there is a continuous flow and people could therefore store enough water to have their bath more than once a day.

The data also show that all the people interviewed have their bath outside the source of water supply. They have their bath either in the bathroom in the house or some structure erected outside the house for that purpose. It could therefore be argued that if there is any kind of water pollution this cannot be attributed to this. Since the people of Kofiase depend on only one source of water supply, which is even inadequate, then all sorts of precautionary measures are taken to make sure people do not either deliberately or through carelessness pollute the water.

From the responses of the respondents it was found that water for their own use -- like bathing and washing is collected by the children themselves. Some of the water thus collected could be used by other members of the household. Because of the inadequacy of supply, children like adults have to get up early in the morning, five o'clock or at times earlier to go and fetch water from the stream. Not much water is stored in this village because it does not have more than enough so as to store what one might not need for his immediate use. The little, however, that is stored, is mainly kept in kerosene tins and earthen ware pots. On the average about 3 gallons of water is used by the children per head.

X. Social Characteristics of Children at Bonyanto

Bonyanto is peopled by Gonjas. It is also an agrarian community. A total of 75 children of less than fifteen years old were interviewed. Of these 81 percent are boys and 18.7 percent are girls.

Table 2.24

Distribution by Sex of Respondents

Sex	Frequency	Percentage
Male	61	81.3
Female	14	18.7
Not stated	-	-
Total	75	100.0

Obviously boys were oversampled. Fifty-seven per cent of these children attend elementary school. Broken down, forty-four per cent are primary school children, and 12 per cent attend middle school. The remaining 41 per cent are not exposed to any type of formal education.

Table 2.25

Distribution by Educational Standard

Standard	Frequency	Percentage
Primary	33	44.0
Middle	11	14.7
Secondary/Technical	-	-
Teacher Training	-	-
Sixth Form	-	-
University	-	-
Other Specify	-	-
Not Stated	-	-
N/A	31	41.3
Total	75	100.0

In terms of occupation, 38.7 per cent of our target children population claim to be self-employed. Bonyanto being a basically agricultural community, it can be inferred that most of these are engaged on their fathers' farms. However, there are a few fishermen and fish mongers among this young population. Very few also claim to be tailors, weavers and seamstresses. It is perhaps against this occupational background that the annual income of these children provides an interesting view. For, at least 32 per cent of them indicate that their annual earnings are as much as ₦100.00. More interestingly,

Table 2.26

Distribution by employment status or Self-employed

	Frequency	Percentage
Employee	-	-
Self-employed	29	38.7
Not stated	-	-
N/A	46	61.3
Total	75	100.0

Table 2.27

Distribution by Income

	Frequency	Percentage
0 - 100 cedis	24	32.0
101 - 500 "	5	6.7
501 - 1000 "	-	-
1001 - 1500 "	-	-
1501 - 2000 "	-	-
2001 - 3000 "	-	-
3001 - 4000 "	-	-
4000+	-	-
Not stated	-	-
N/A	46	61.3
Total	75	100.0

6.7 per cent of them place themselves within \$101-500 annual income bracket. This invites the view that a good number of these children are gainfully self-employed. Hence there exists the possibility of their contributing significantly to the economy of the village.

Turning to the religious factor, it seems clear that the community is mostly Moslem (Table 5). Admittedly, there are a sprinkling of traditionalists (9.3 per cent), Presbyterians (21.3 per cent), and Catholics (17.3 per cent). But at least one out of every two children interviewed is of Moslem religious background.

Table 2.28

Distribution by Religion

Religion	Frequency	Percentage
Catholic	13	17.3
Presbyterian	16	21.3
Anglican	-	-
Methodist	-	-
Moslem	38	50.8
S.D.A.	-	-
Other specify	-	-
Traditional	7	9.3
Not stated	1	1.3
Total	75	100.0

In sum, the Bonyanto under fifteen years olds target population are Gonjas, mostly self-employed in agricultural production, are mostly school children, and are of Moslem religious background.

XI. Water Use. Views and Habits

One of the major objectives of the present study is to examine the modes and volume of water use. Otherwise stated, there is the need to explore how and how much water is used by the community. To explore the various uses to which water is being put, one item of the questionnaire asked: what do you use water for?

Table 2.29

Distribution by what do you use water for

Uses	Frequency	Percentage
Drinking	57	76.0
Cooking	8	10.7
Washing	-	-
Bathing	10	13.3
Construction	-	-
For animals/birds	-	-
Other	-	-
None - other	-	-
Not stated	-	-
Total	75	100.0

More than three quarters (76%) mention drinking as the first mode of the use of water. Cooking and bathing is mentioned by 40 and 33.3 per cent respectively as the second purpose for which water is being used within the community. And at least one out of every four of the respondents indicates, as the third mode of water use, cooking, bathing and washing. It is interesting to note that with reference to the first mode of the use of water absolutely no respondent mentioned bathing and only an insignificant minority (9.3 per cent) indicate bathing as the second way of water use. This invites the observation that since

the community does not have satisfactory availability of water, use is determined by what is defined as strictly necessary. This observation appears to have factual support from consideration of the amount of water used.

To top this variable, that is, the amount of water used one item of the questionnaire asked: how often do you use water? The response categories provided were: not often, often, very often. Almost all the children (97.3 per cent) rarely use water. None of them neither uses it often not very often. This impression is reinforced by the frequency of bathing. To examine the concrete way of water use the respondents were asked: how often do you take your bath? The response categories provided were: once in three days; once in two days; once a day; twice a day.

Table 2.30

Distribution by Frequency

How often	Frequency	Percentage
Not often	73	97.3
Very often	-	-
Often	-	-
Not stated	2	2.7
Total	75	100.0

The evidence indicates that most of the children (60 per cent) bathe only **infrequently**, at most once a day. On the other hand a very insignificant number (4%) bathe twice daily (Table 2.31). A vast majority of them (92%) take their bath in the bathroom. Other bathing spots mentioned include open space (4%). Exactly two-thirds of these children fetch the water by themselves; and at least one out of every four (26.7%) indicates that it is the mother who fetches the water for them.

Table 2.31

Distribution by How often do you take your bath

How often	Frequency	Percentage
Once	45	60.0
Twice a day	3	4.0
1 in 3 days	9	12.0
1 in 2 days	15	20.0
	-	-
	-	-
	3	4.0
Total	75	100.0

XII. Social Characteristics of Children at Kanvili

Kanvili, like Bonyanto, is an agrarian village engaged mainly in subsistence farming. It is a Dagomba village. Our sample of under fifteen year olds consists of 120 children. Boys constitute 62.5, and girls 37.5 of the sample.

Table 2.32

Distribution by Sex of Respondent

Sex	Frequency	Percentage
Male	75	62.5
Female	45	37.5
Not stated	-	-
Total	120	100.0

A rather low percentage (17.5 percent) currently attend primary school, and four percent middle school. The remaining 79.2 percent are illiterates.

Table 2.33

Distribution by Employment Status

Employment Status	Frequency	Percentage
Employee	-	-
Self-employed	34	28.3
Not Applicable	86	71.7
Not stated	-	-
Total	120	100.0

With regards to occupation, at least one out of every four of them (28.3%) claim to be self-employed. In all likelihood, they are engaged in food cultivation on their fathers' farms. The same percentage of children indicate that their yearly earnings fall within the \$0-100 bracket.

Table 2.34

Distribution by Income

Income	Frequency	Percentage
0 - 100 ...	34	28.3
101 - 500 ...	-	-
501 - 1000 ...	-	-
1001 - 1500 ...	-	-
2001 - 3000 ...	-	-
3001 - 4000 ...	-	-
4000+ ...	-	-
Not Applicable	86	71.7
Not stated ...	-	-
Total	120	100.0

In terms of religious affiliation, 3.3 percent of these children are Catholics, 21.7 percent follow the traditional religious practices, and a vast majority (56.7 percent) belong to the Moslem religion.

Table 2.35

Distribution by Religion

Religion	Frequency	Percentage
Catholic ...	4	3.3
Presbyterian ...	-	-
Anglican ...	-	-
Methodist ...	-	-
Moslem ...	68	56.7
Other specify ...	1	0.8
Traditional ...	26	21.7
Not stated ...	21	17.5
Total	120	100.0

Hence, the Kanvili under fifteen year olds reflect the following broad characteristics: they are mostly boys who have not been exposed to formal schooling, and are affiliated with the Moslem religion.

XIII. Water Use: Views and Habits

Our interest in this section is to see just how water is used. A second and related question is to attempt to measure the amount of water being used. One might mention that Kanvili has pipe-borne water. Many children are involved in the task of collecting water either for storage or for use. For 60.8 percent of the children interviewed collect water for their own use.

Table 2.36

Distribution by who collects water for use

Collector	Frequency	Percentage
Self	73	60.8
Mother	44	36.7
Brother/Sister	2	1.7
Other relative	-	-
Not stated	1	0.8
Total	120	100.0

In the case of 36.7 percent of them, the collection is done by their mothers.

Turning to the question of specific uses of water, 65 per cent first mentioned drinking. A good number of the children (29.1%) also mentioned bathing first as the mode of water use.

Table 2.37

Distribution by Use (Specify)

Uses	Frequency	Percentage
Drinking	78	65.0
Cooking	2	1.7
Washing	3	2.5
Bathing	35	29.1
Construction	-	-
For Animals/birds	-	-
Other	2	1.7
Not stated	-	-
Total	120	100.0

Drinking was mentioned by 20.8 per cent as the second use, whereas 60.9 indicate bathing as the second use to which water is put. Almost one-third (32.5 per cent) mentioned bathing as third use of water.

Turning to the amount of water used our data indicate that a large percentage (44.2%) of the children use water often. And almost an equal number of them use it either not often or very often.

Table 2.38

Distribution by How often do you use water

How often	Frequency	Percentage
Not often	34	28.3
Very often	33	27.5
Often	53	44.2
Not stated	-	-
Total	120	100.0

That water is used frequently at Kanvili is abundantly clear for as many as 64.2 per cent of the children bath twice daily. A much lower number of them (35%) bathe only once daily. (Table 2.39) For those who use water very often an amount of 4 gallons is used; and for those who use water often an amount of 2 gallons is used. And of those not often; an amount of one gallon is used.

Table 2.39

Distribution by How often do you take your bath

How often	Frequency	Percentage
Once	42	35.0
Twice a day	77	64.2
1 in 3 days	-	-
1 in 2 days	-	-
Thrice	-	-
Not stated	1	0.8
Total	120	100.0

In other words, all of them bathe at least once a day. Bathing is done mostly on the bath room and open space. The data suggests the hypothesis that the amount and type of water available determines its pattern and magnitude of use.

Table 2.40

Distribution by who collects water for your use

	Frequency	Percentage
Self ...	50	66.6
Mother ...	20	26.7
Brother/Sister	-	-
Other relatives	-	-
Not stated	5	6.7
Total	75	100.0

That the determinant of water use is its availability is strongly suggested by our data. Drinking ranks highest in the use priority. Then comes cooking and bathing in that order. Washing was not mentioned at all in the first use, is alluded to only by a few as the second use, and shares equal importance with cooking and bathing in the children's indication of its third use. One might be allowed to opinionise that peoples' definition of water use priorities would tend to be contingent on the type and amount of water available.

In summary, the following observation can be made. There is no remarkable regional difference regarding water use. In all the communities children were found to exhibit similar pattern in the use of water. The other observation is that those children who were in school use more water than the non school going children. Also, children were the principal agents in fetching water.

CHAPTER 3

Views and Habits of Adults regarding water use
(Eastern Region)

I. Introduction: In this chapter, we shall discuss the social characteristics of the adult population which have relevance to the understanding of how they use water. The views and habits of the people will be discussed. Then a summary of the salient features of this discussion will be provided.

II. Background Characteristics of Adult respondents at Adubiase

In the total sample, we interviewed 120 respondents. Of this number, 50.8% were males and 49.2 were females.

Table 3.1 Distribution by sex of respondent

Sex Differential	Frequency	Percentage
Male	61	50.8
Female	59	49.2
Total	120	100.0

Turning to age structure, we find that a significant number of them were in fact above the age of 35, (71 of them); this represents about 59.2% of the people. Within the age group of 15 to 35,

Table 3.2 Age Distribution of the respondents

Age	Frequency	Percentage
0 - 14	-	-
15 - 24	12	10.0
25 - 34	35	19.1
35 - 44	26	21.7
45 - 54	26	21.7
55 - 64	9	7.5
65+	10	8.3
Not stated	2	1.7
Total	120	100.0

Many of them were newly married couples; they work in clerical jobs in the village; They rent houses and rooms from the older household heads.

Among the total group of respondents, 39.2% were literates and the majority of them (60.8%) were illiterates. The literates have received an elementary form of education, 2.5% were trained teachers, and some were trained in clerical jobs. This gives us an insight into their occupational structure. And among the illiterate group, many were self employed, farmers, masons, carpenters and hunters.

Table 3.3 Educational Background of Respondents

Type of Education	Frequency	Percentage
Primary	10	8.3
Middle	30	25.0
Secondary/Commercial	2	1.7
Teacher Training	3	2.5
Sixth form education	-	-
University	-	-
Other specify	2	1.7
Not appointed	73	60.8
Total	120	100.0

Respondents were asked to give us an insight into their yearly income.

It must be remembered in this direction that it is really difficult to estimate or to ask people in rural areas to declare their income. They are rather suspicious about this type of exercise. Also in all fairness they find it difficult to make their financial assessment because of the nature of the activities they engage in. However with these limitations, we were able to determine their income distribution which shows that the majority of them (81.7) earn very little, between 101-1000 cedis per annum. As many of them were found in low income jobs, these figures seem to be a true reflection of the existing income structure for these grades of workers.

The clerical workers earn about 501 to 1500 cedis, annually. Some of the farmers, especially those with small farms, earn very little; the estimated figure is between 200-500 cedis, in a good crop season. In the area where the farmers grow cocoa, coffee and foodstuff some make an annual income of about ~~1500-~~2000.

Table 3.4 Income distribution of the Respondents

Income Differential	Frequency	Percentage
0 - 100	1	0.8
101 - 500	42	35.0
501 - 1000	56	46.7
1001 - 1500	4	3.3
1501 - 2000	5	4.2
2001 - 3000	2	1.7
3001 - 4000	-	-
4000+	-	-
Not applicable	3	2.5
Not stated	7	5.8
Total	120	100.0

Turning to their household profile and marital arrangement, many of the respondents were married and stayed with their families in their own households. Among the single household heads, we were informed that a significant proportion of them were widows. The remaining few were young workers (see Table 3.5) Usually many relatives stay with the heads of the households.

Table 3.5 Marital characteristics of Respondents

Marital Status	Frequency	Percentage
Married	85	70.9
Single	34	28.3
Not applicable	-	-
Not stated	1	0.8
Total	120	100.0

This is not surprising because kinship forms the basis of the nature of their social organization. The implication is that many relatives very often use limited facilities in the household. On the average however, the existing family size was between 4-6 children. We can estimate between 8-9 people to constitute a household, including the man his wife and relatives.

There were few indications to suggest that some of the older married men had children in other places; they visit occasionally. In terms of household responsibility, that is to say, in caring for members of their families, about 65.8% stated that they have at least 8 people under their care. The uncertainty in determining the precise number of people forming the nucleus of household has implication for water use. Relatives visit unannounced and due to the fact that they are kinsmen they use the limited household facilities and resources.

III. Water Use and Habits of the people at Adubiase

In Adubiase there is no pipe-borne water. The inhabitants use the traditional mode of water supply. They fetch water, mainly, from a stream, which is about 5-20 minutes walk from their households.

Table 3.6 Distance from house: water supply

Distance	Frequency	Percentage
Near 0-4 minutes	4	3.3
For 5-20 minutes	116	96.7
Very far 21+ minutes	-	-
Total	120	100.0

The local inhabitants think that their traditional water source is far from their houses and that it is rather difficult and cumbersome for them to go up and down, the river side, to fetch water for household use. In this respect, they suggested that children were mainly used to fetch water because they have the capacity for hard work. At times, especially during the dry season, they experience water shortage in this village. It means that the children take more time to collect from the rivers during the shortage period (in the dry season) because the river does not flow at normal capacity. The problem is not so serious as to necessitate going

out of the community to find water for their daily use. On the other aspect of water use, there were no specific rules regarding water use, but by convention, the inhabitants know that water should not be wasted and that washing in the river is forbidden.

As seen in the accompanying table, it is quite clear that specific rules and regulations are not formulated by the locals to delineate what are expected of the users of water. This is infact the case in many traditional based communities. It must be remembered that the interaction is face to face and sanctions are provided by the adult group who are ⁱⁿ constant touch with the children.

Table 3.7 Rules regarding water use

Type of Rules	Frequency	Percentage
No specific rules	114	95.0
Washing is forbidden	1	0.8
Taking good care of water	1	0.8
No wastage	3	2.5
Paying of water rate		
Not stated	1	0.8
	120	100.0

Both grown up children and female adults figure prominently in fetching water for household use. The usual times used to fetch water are in the mornings and in the evenings. In the mornings, this activity seems to be the first duty for those whose duty is to fetch water. It goes to show how important water is for people first thing in the morning in their day to day household activities.

Table 3.8 Distribution by who collect water for household use

Type of People	Frequency	Percentage
Male Adults	10	8.3
Female Adults	47	39.2
Little male children	9	7.5
Little female children	7	5.8
Females only	15	12.5
Only children	15	12.5
Others	17	14.2
Total	120	100.0

It is clear from the above table that children and young female adults are the principal agents who collect water for household uses. Except within few households, grown up women are not really involved in this exercise. It may be noted, however, that some old women in fact fetch water for their own use, because there were no children in their houses or the children were ill. We can say then that in households where there are able and fairly grown up children, the job of fetching water for household use, is the responsibility of children. In carrying water from the riverside buckets and pans were used. They empty these containers into big barrels, which are usually found in many houses. These large containers stand in conspicuous places and are easily accessible. About 40 gallons of water can be stored in one container. The unfortunate point is that in many places the containers have no covers, so all types of particles and other flying insects and objects can easily settle in them. We were informed by the village sanitary inspector that it is his duty to go round the houses to educate the people to cover the containers. He was however experiencing difficulties in this respect. To many of the inhabitants it is much easier to work with water containers which have no covers.

Table 3.9 How water is stored in the household

Type of containers	Frequency	Percentage
Barrel	110	91.7
Bucket	1	0.8
Clay Pot	3	2.5
Kerosene Tin	4	3.4
Other containers	1	0.8
Not stated	1	0.8
Total	120	100.0

Water is used for the following purposes, drinking, cooking for household, bathing and for washing their clothes. They do not use water for watering plants, construction work and for feeding animals and birds. In ordinary days, each household member uses about $1\frac{1}{2}$ buckets of water for the above mentioned purposes (about 5 gallons).

Table 3.10 Main Uses of Water

Uses of Water	Frequency	Percentage
Drinking	47	39.2
Washing/laundrying	22	18.3
Cooking for household	26	21.7
Cooking for commercial purposes	1	0.8
Not stated	1	0.8
Total	120	100.0

IV. Taboos, Rituals and Myths

It is a popular knowledge, in the village, to keep to these observances: that no walking is permitted to take place in the river, that during the night it is against the established custom for any one to go to the river side; that no one should go to the river side with a light; that fetching water at night is not allowed; and that women should not go to the river side during their "period". These observances were strictly adhered to because of the fear of death which was the ultimate punishment the gods and other spiritual agencies would impose upon the defaulter. It is interesting to note that the younger generation indicate that

Table 3.11 Taboos regarding water use International Reference Centre for Community Water Supply

Types of Taboos	Frequency	Percentage
None	106	88.4
No walking in the river	1	0.8
No light at night	1	0.8
No fetching of water at night	1	0.8
Menstruation women forbidden	1	0.8
Don't know	10	8.4
Total	120	100.0

they did not know of any specific taboos but when they were asked to enumerate the expected behaviour with regard to "fetching water" they all agreed that it was forbidden for people to go to fetch water during the night and that women in their menstrual period are strictly forbidden to approach the river. Built into these taboos is the rationale to keep the water source clean from pollution.

Now turning to rituals, only the very old persons, indicated that during the olden days seasonal pouring of libation, pacification and slaughtering of goats, sheep and fowls were performed, to pacify the river god. And that, at present, such observances were performed only by the chiefs and his other ritual functionaries. They pour libation to the river god only during the dry season. Also, annually, they slaughter an animal or a bird to pacify the river god. There is still a deep seated belief in the notion that the river is a god, that it possesses a

Table 3.12 Local Rituals

Types of Rituals	Frequency	Percentage
None	102	85.0
Seasonal libation	2	1.7
Annual slaughtering of an animal or bird	6	5.0
Don't know	10	8.3
Total	120	100.0

consciousness of kind. And that it is through its generosity that the living is blessed with the freshness of its waters. So the existing belief, in the minds of the old people, is that occasional pacification is useful, so that water can be obtained.

It is believed that if the inhabitants start to clear the undergrowth, the river will dry up. For this reason, weeding is forbidden in and around the river. The river is looked upon as a gift from their ancestors and for this reason no one must annoy the river. It is also a fertility god: all married couples and pregnant women are expected to respect the river. Related to this idea, women in their "periods" and in the later stages of their pregnancy are asked to stay away from the river. They are regarded as unclean and should not pollute the waters of the river. In a mythical way, if they expect to procreate and to be fertile then they must stay in the good books of the river god. Turning to mythical beliefs, only few people, of the older generation, hold rigidly mythical beliefs.

Table 3.13 Local Myths and Beliefs

Local myths and beliefs	Frequency	Percentage
None	106	88.4
No clearing of undergrowth	1	0.8
Help barren women to give birth	1	0.8
Ancestors protection	1	0.8
Can't tell	10	8.4
Total	120	100.0

V. Other Observations regarding water use

Many of the people we interviewed mentioned that in the dry season, they experience various difficulties in obtaining water. The children have to spend more time, at the river side, to fetch water. The water is very often polluted. A lot of sediments settle in the containers. For these reasons, local dams are constructed by members of the village committee to encourage the free flow of water. Water collection is also supervised by them. When they were asked whether they travel to other places in search of water during the dry season, about 20.8% of them answered that during the dry season, they experience periodic water shortages but they do not go outside the village in search of water.

It was also mentioned that in the wet season, water is used for constructional work. It is during this time that new houses are built. Bricklayers take the opportunity to make bricks. Apart from this, it can be said that water is used mainly for household consumption, for drinking, cooking bathing and for washing purposes.

Almost all the respondents confirmed categorically that they would prefer pipe-borne water. The reasons for their preference for pipe borne water are

- (1) because of health reasons;
- (2) because pipe borne water is cleaner than traditional source of water supply.

Table 3.14 Distribution by which water supply you prefer

Type	Frequency	Percentage
Traditional	8	2.5
Modern	116	96.7
Not stated	1	0.8
Total	120	100.0

(3) because it is easy to obtain and a time saving device and (4) that periodic shortages would be minimised considerably.

Table 3.15 Reasons why you prefer pipe borne water

Reasons	Frequency	Percentage
Health reasons	84	70.0
Traditional supply impure	4	3.4
Modern water supply is time saving	22	18.3
Easy to obtain & no more shortages	2	1.7
Don't know	5	4.2
Not stated	3	2.5
Total	120	100.0

In essence, the people are very much aware of the dangers in drinking from traditional source. This awareness was mentioned very often by the educated group. They were very conscious of the fact that many diseases, of infectious nature, are contacted through the use of traditional source of water supply.

We were also interested to find out whether the people in Adubiase have made any attempt to improve or to find an alternative source of water supply. Surprisingly, the great majority of them mentioned that nothing has infact been done in this direction. Of the few who answered that some thought has been given to the idea of taking a community action to improve the source of their water supply, the following measures were mentioned.

(1) that there is the need for community action to clean the environment of the traditional water source. (By this they meant that periodic cleaning was necessary to improve the sanitation and to lower pollution.) Infact no community action has ever been taken in this direction. Other measures mentioned were: (2) that during the dry season strict control should be instituted to control the use of water and that (3) wells and dams must be constructed. In this direction they would prefer hand pumps.

Table 3.16 Community action to safeguard water supply

Action to be taken	Frequency	Percentage
Cleaning of the environment	16	18.3
Strict control during dry season	3	2.5
Wells and dams to be made (Hand Pumps)	11	9.2
People should be warned against pollution	7	5.8
No thought has been given	76	63.8
Not stated	7	5.9
Total	120	100.0

VII. Community Participation and other Views

The respondents were asked to indicate whether the inhabitants suffer from many ill-effects as a result of drinking from the traditional sources of water supply at Adubiase. A significant proportion of them answered that the following ills were contacted through drinking and bathing from the rivers: stomach troubles, bilharzia, worms, river blindness and other minor skin infections. In other words, they were aware of the ill effects of using traditional sources of water supply; and there were indications that some of ^{the} children and adults sometimes suffer seriously from many of the above mentioned ills, especially from bilharzia.

Table 3.17 Distribution by type of infections

Type of infection	Frequency	Percentage
River Blindness	1	0.8
Bilharzia	8	6.7
Worms	2	1.7
Stomach troubles	38	31.7
Headaches	-	-
Other Infections	7	5.8
Not stated	7	15.8
Not applicable	57	47.5
Total	120	100.0

Many of the educated people were very conscious of this fact and as a result they boil their water before drinking. To them it is infact an inconvenient exercise.

In the use of water, no specific body or individuals are held responsible for seeing to its administrative and technical management which may arise; water usage is left in the hands of the individual and his household. Occasionally, when there is water shortage people gather in front of their houses to discuss the issue. At times, people assume that the chief, being the custodian of the land and property in the community, is the person who should take the responsibility to normalise water shortage.

Table 3.18 Responsibility in taking care of water supply

Who is responsible	Frequency	Percentage
Nobody	82	68.3
The chief	2	1.7
Queen mother	15	12.5
Town Committee	7	5.8
Elders	6	5.0
Don't know	8	6.7
Total	120	100.0

As seen in the above table, the majority of the people think that the chief is powerless in this regard. Infact, it was indicated that people do not bother to report cases of water shortage to him. In terms of crises, the village development committee is very often approached. Members of the Committee are mostly literates and as many of them are not resident in town, in many cases, it is rather difficult for the Committee to meet and to tackle concrete issues.

The queenmother was also mentioned by many of the women respondents to be the person to approach in terms of water crises. Some of them discuss the issue of water shortage with the queen mother. This concern stems from the fact women are mainly engaged in these activities. And as the queenmother is concerned with the direct administration of women affairs, this issue is often referred to her. She informs the chief and his elders. In this community, periodic shortages are experienced only

in the dry season. Even during this season, real water shortage is not known. What is experienced is that there is poor flow of water which makes it difficult to gather water at regular times. When this problem occurs, a dam is dug by selected community members to encourage water to flow easily for collection. The obvious implication is that the collected water contains more debris and other impurities, than usual.

At this point, almost all the respondents mentioned that their community would be willing to contribute to obtain modern water supply. Infact they were unaware of the cost function in maintaining modern water supply. They have only heard about some of its main advantages, through

Table 3.19 Whether Community desires modern water supply

Distribution	Frequency	Percentage
Yes	119	99.2
No	1	0.8
Total	120	100.0

friends, relatives and returning migrants. They were asked specifically to indicate whether they would be willing to contribute to secure and maintain modern water supply. Again a significant majority of them indicated their willingness. It is quite clear that rural people

Table 3.20 Would you be willing to
Contribute to modern water supply?

Distribution	Frequency	Percentage
Yes	119	99.2
No	1	0.8
Total	120	100.0

desire modern water supply. From their own cost benefit analysis, they know about the advantages of using clean pipe borne water. What they do not know is what contribution they need to offer to see to its maintenance. They were unaware of the fact that the infrastructural development in this area (of modern water supply) is poor and that communities which did have modern water supply were experiencing difficulties in obtaining water (either the flow is inadequate or irregular).

In their enthusiasm to obtain modern pipe borne water, the respondents indicated that they would pay some contribution to maintain the system. Majority of them would be willing to pay between one to five cedis.

Many of these people were workers in the artisan, farming and low clerical grades. Considering their pay differential this type of contribution is an adequate contribution. Of those in the middle and high income earning group, they specified that they would be willing to pay between ten to 15 cedis to maintain the system.

Table 3.21. How much contribution to maintain modern water supply

How much	Frequency	Percentage
Less than ø1.00	3	2.5
Between ø1 - ø5.00	71	59.1
Between ø5+ - ø10.00	5	4.2
Between ø10+ - ø15.00	14	11.7
Between ø15+ - ø20.00	-	-
Between ø20+ - ø25.00	2	1.7
ø25+	2	1.7
Not stated	23	19.1
Total	120	100.0

It is also interesting to note that in their desire to obtain modern pipe borne water, they would make the contribution a part of the community's periodic tax system. In the normal circumstances they do not pay for water but they would be willing to contribute. We think it is a good beginning for them to know that modern water supply costs money to build and to maintain. This new idea would be encouraged if the authorities do not disappoint them.

The respondents also think that it is the duty of the Central Government to provide them with pipe borne water. To them, they pay cocoa tax and other indirect tax; to the workers in the administrative jobs, their argument was that they pay both **direct and indirect tax**. For these reasons, they all think seriously that the onus is on the central government to build rural water system. However in their immediate desire to get clean water supply they indicated their willingness to make an initial contribution.

Table 3.22 Distribution by who do you think should take steps to provide you with pipe borne water

Agencies	Frequency	Percentage
Government	83	69.2
Chief & Elders	25	20.9
Water & Sewerage	1	0.8
District Council	1	0.8
Town Committee	6	5.0
Can't tell	4	3.3
Total	120	100.0

They also pointed out that anytime they pay direct tax in their community, the money is taken away to the district council and to the government chest. Infact no part of the money is set aside to develop the community's services. For this reason, the village has no accumulated fund to fall upon to develop its water services. It is therefore logical for them to establish the point that it is the main responsibility of the central administration to help them to get modern pipe borne water supply.

The following concrete suggestions were given relative to maintain a modern pipe borne system.

(1) they would wish to encourage, by stipulated law, the payment of monthly water rate ^{of} about $\text{Ø}1.00$ per household; (2) that they would appoint people to clean and repair the pump station and dam. (3) they would encourage people not to waste water and (4) that it should be the responsibility of the village development committee to oversee to the day to day running of the system.

Table 3.23 Suggestions on Water Maintenance

Suggestions	Frequency	Percentage
No suggestion	1	0.8
To pay water rate $\text{Ø}2.00$ annually	34	28.3
Regular repairs	2	1.7
Weekly cleaning	9	7.5
No wastage	26	21.7
Pay for repairs	1	0.8
Can't tell	43	35.8
Not stated	4	3.4
Total	120	100.0

To the inhabitants in this community, it is their desire to have a modern pipe borne water supply because it is a clean source of water; it is hygienic, it is time saving and it would help them to give more time to other productive activities. From the health point of view, they also think that many of their ills would be minimized and that the mortality and morbidity rates among children and pregnant women would be reduced.

The health picture shows that in this rural community infant death rate is comparatively high. Infact as Sai indicated (Sai 1972) about 50% of the overall death rate in the rural country is attributed to children's deaths (0 - 5 year group). The contention is that because of lack of resistance in children, infectious and parasitic (water borne diseases) diseases take a heavy toll of rural children. It is from this point of view, that many of the conscious group of respondents are asking the central authorities to expedite modern water supply.

Table 3.24 Reasons why Pipe Borne water

Reasons	Frequency	Percentage
Health reasons	92	76.7
Existing traditional source is dirty	1	0.8
Time saving	15	12.5
Medicated water	2	1.7
Easy to obtain	2	1.7
Don't know	8	6.8
Total	120	100.0

In the final analysis, the respondents maintained that sanitation in the community would be improved considerably if they obtain modern pipe borne system. They emphasized that the general cleanliness in their households would be maintained and from the health point of view they would be drinking from treated water.

Table 3.25 What changes would modern supply bring

Changes	Frequency	Percentage
Healthwise	39	32.5
Time Saving	11	9.2
Cleanliness	43	35.8
Work input	1	0.8
Social interaction	17	14.2
No shortage	1	0.8
Not stated	8	6.7
Total	120	100.0

VII. Background Views of Respondents at Bososo

In order to get a deeper insight into water usage we need to look at the background social characteristics of the respondents and to examine the nature of the interrelated variables, such as water habits and views. At Bososo, 81 people were interviewed out of this number, 76.5% were males and 23.5% were females. Though the probability sampling technique was used (in the sample selection), it is quite obvious that males were over sampled. It is also important to note that in the area of household heads male heads predominate.

Table 3.26 Distribution by Sex of Respondents

Sex	Frequency	Percentage
Male	62	76.5
Female	19	23.5
Total	81	100.0

Many of the respondents were in the age range of 15-55 years. About 59% of them were adults (25-54 years). This age differential reflects the true nature of the people in this town. It is also interesting to note that the majority of the people were educated. As we pointed out in the introductory chapter, Bososo has a history of many elementary schools. It is a semi-urban area, its population is quite heterogeneous in terms of ethnicity and as a result there are administrative job openings, so many clerical workers reside in this town. Infact in the olden days it was a flourishing cocoa marketing and cocoa buying centre.

Table 3.27 Distribution by Age of Respondents

Age	Frequency	Percentage
0 - 14 years	7	8.7
15 - 24 "	15	18.5
25 - 34 "	18	22.2
35 - 44 "	18	22.2
45 - 54 "	12	14.8
55 - 64 "	9	11.1
65+	2	2.5
Total	81	100.0

The pay structure shows that many of the workers are low and middle range income earners. There were also self-employed artisans. Of those who were self-employed, many of them were also farmers. There were few officers, in the high grade income bracket, found in the supervisory grades,

Table 3.28 Distribution by Income

Income per annum	Frequency	Percentage
0 - 100	-	-
101 - 500	5	6.2
501 - 1000	30	37.0
1001 - 1500	31	38.3
1501 - 2000	8	9.9
2001 - 3000	2	2.5
3001 - 4000	3	3.7
4000+	-	-
Not stated	1	1.2
Total	31	100.0

in teaching and hospital work. By the average Ghanaian standard, the existing pay structure suggests, that Bososo is a semi-urban town, supporting clerical and administrative workers. The majority of the respondents were married (70.4%). Only 29.6% mentioned that they were single. This later category includes, never been married before and presently divorced or widowed people. Turning to religious affiliation, a good many of them were christians (50.7%) and 17.3% of them were Moslems.

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Table 3.29 Distribution by Religion

Religion	Frequency	Percentage
Catholic	2	2.5
Presbyterians	25	30.9
Anglican	5	6.2
Methodist	9	11.1
Moslem	14	17.3
Other Specify	15	30.8
Traditional Religion	1	1.2
Not stated	-	-
Total	81	100.0

In a typical household, many of the people were fairly well educated, they were Christians and were found in gainful employment. In terms of household responsibility, an average household head looks after about 6 people. As shown in the accompanying table, 45.7% of them indicated that in terms of economic household arrangement, they have responsibility to care for 4 people; another 25.9%, look after about 8 persons. These statistics have implications for water use in a given household. The average arrangement is that in household, there were about 6 people, comprising of the man, his wife and four children.

Table 3.30 Distribution by number of persons in a household

No of Persons	Frequency	Percentage
None	20	24.7
1 - 4	37	45.7
5 - 8	21	25.9
9 - 11	3	3.7
11+	-	-
Total	81	100.0

VIII. Water Use: Views and Habits

It is of interest to note that Bososo has a modern pipe borne water supply. Yet the majority of the people indicated that they still use the traditional system. They mentioned that the modern source of water supply was unreliable, that in many cases, only the health clinic officials, their patients, and few educated elites were supplied with water. It was also indicated that the Water and Sewerage representatives, in many cases, have the habit to open the water on irregular days and only for few minutes duration.

It was therefore equally difficult for many of the locals to predict when to expect water from the standing pipes. There were about 6 standing pipes in town. The problem was not with the number of pipes but with its function. On certain days of operation, the pressure from the pumping tap station was found to be so low that it took a long time to fill a bucket. This gives rise to argument; and fighting occurs at times among children in order to get a bucket filled. For many of these reasons the general practice of many of the local inhabitants was to continue to draw water from the traditional reliable source, Yaya and Boso rivers.

Table 3.31 Distribution from where do you normally obtain water

Source	Frequency	Percentage
River/Stream/pond	77	95.1
Pipe Borne	1	1.2
Both of the above	-	-
Other source	2	2.5
Not stated	1	1.2
Total	81	100.0

It was found that the locals take things for granted. They made no reports whatsoever to the local authorities about the difficulty they experience in obtaining pipe borne water. One person mentioned "What is the use to make a report. No one listens. And no one takes you serious. They think you are the complaining type and for this reason, at times you court the displeasure of the water representative and his immediate attendant." At times, the water issue is discussed at the local council level by the elders. The elders informed us that in the past they have made several attempts to get the water problem solved; but they find it difficult to gain a meaningful attention. Now there is a general state of apathy and total resignation reflecting the true mode of the people. One young literate worker in town mentioned that "the people in charge of the local water station assumes that you are rude and the reporting type if you continue to make a report at the local authority office."

Those found in the local administrative office were in good relationship with the water and Sewerage representatives. They move together. They live in the same section in the town and were given the privilege to use modern water facilities. In other words the elites are provided for so the majority of the local people find it difficult to make a meaningful report.

Of those who still use the traditional source, they stated that the water is not clean but as they have no other choice, they would continue to use the traditional source. The approximate distance from the river side was about 5 - 20 minutes walk from the nearest house. In their own estimation, the place (traditional water source) is far away from their houses. The exercise

Table 3.32 How far are the sources from your house

Distance	Frequency	Percentage
Near 0 - 4 minutes	15	18.5
Far 5 - 20 minutes	57	70.4
Very far 24 minutes	8	9.9
Not stated	1	1.2
Total	81	100.0

of carrying water is carried out by the young, usually in the mornings and in the evenings; each child of about 7 - 14 years of age carries about 6 buckets of water a day for household use. Many of the inhabitants have resigned themselves to the fact that the traditional mode of water supply is the main source of their water supply. In this respect, they have no real difficulty in obtaining water from it except during the dry season. Even in the dry season they did not have to travel outside the town to fetch water. At times, one section of the community needs to go to the other side to fetch water. This is of course a source of inconvenience hardship and a time wasting exercise, especially for those who have to work in the offices.

Table 3.33 Distribution whether travel to fetch water outside the town

Outside travel	Frequency	Percentage
Yes	2	2.5
No	78	96.3
Not stated	1	1.2
Total	81	100.0

In fact those who did state that they travel outside to fetch water during the dry season, they were found to be out of town farmers (who live on their farms in the other villages during the period in question).

Respondents were also asked whether there were explicit rules and regulations regarding water use. As shown in the preceding table,

Table 3.34 Rules and Regulations Regarding Water Use

Rules & Regulations	Freq.	Perc.
No rules	60	74.1
Washing is forbidden at river side	2	2.5
Asked to take good care of water	6	7.4
No idea	12	14.8
Not stated	1	1.2
Total	81	100.0

there is a clear indication that the local inhabitants have no clearly stated rules and regulations. By convention, as it were, they keep in mind certain traditions **which** are mainly passed down to them through the oral tradition. These traditions are not strictly followed.

During the dry season, the chief and his elders do not institute any precautionary measures. The locals are expected to know that there is a water shortage. No one verbally complains. The concept of making a complaint, as has been mentioned earlier, is not the usual practice. This observation raises the problem of feedback. How do the authorities know about difficulties with regard to water use? The nature of the society is such that the people in authority are expected to command respect; they are not to be spoken to in negative terms. Any such approach might be interpreted as a sign of being rude, or becoming the complaining and disrespectful type. In such a system, it is difficult to hear from the people their true feelings. They have been subjected to all types of hardships, so they expect very little from the system. Only few of the educated elite were found to be vocal in this regard.

Turning to the question of who normally fetch water for the household use, the main indications were that female adults, young girls

and young male children are engaged in this work. This is in fact the procedure in many Ghanaian communities. It is precisely in this direction that children are desired. Due to the nature of the existing social institutions, economic and social arrangements coupled with the fact that there is a lack of infrastructural development, there is a positive relationship between social structure and fertility. Almost always, in a typical household, children and young female adults are found to perform these crucial household functions. The old people are more or less the supervisors (in many cases) and through imitation and practice these young functionaries are socialized into the traditions of the community

Table 3.35 Who normally collects water

Type of People	Frequency	Percentage
Male adults	10	12.3
Female adults	14	17.3
Male juvenile	-	-
Female juvenile	13	16.1
Combination of 2 & 4 categories	26	32.1
Combination of 3 & 4	6	7.4
Combination of 5 & 6	9	11.1
Not stated	3	3.7
Total	81	100.0

In the household water is used in bathing, washing, cooking and for drinking. In the evening, water is needed for many of the above stated functions. The adults as well as the children need to take their bath, food needs to be prepared in the mornings and in the evenings. At times, when there is a special need, children are told to fetch water in the afternoons. In many of the households, where proper storage places exist, children are discouraged from fetching water in the afternoons. The usual containers used to fetch water are buckets and tins. Each person carries about 2 - 3 gallons of water (especially the very young) and the adults carry a much heavier bucket or tin which may contain about 4 gallons of water. In essence, each household uses

about 30-40 gallons of water a day. In this estimation a household has 6 members, on the average.

It is equally interesting to note that water is strictly controlled by the older members of the family. For drinking purposes, many adults keep coolers and special water pots in their sitting or bedrooms. These water reserves are for drinking purposes only. Strangers, to the households, are given water from these containers. However it is also usual to find people in a house, drinking from the big standing barrels. It is observed in this community that small sized pans are kept inside the big barrels for the purposes of collecting water to avoid contamination and to keep the containers in hygienic conditions. This procedure was observed to be the norm in enlightened homes where literacy predominates. In this direction, it must be remembered that the majority of the inhabitants in this community have obtained basic education up to at least the elementary school level.

Table 3.36 How is water stored

Containers	Frequency	Percentage
Barrels	57	70.4
Buckets	-	-
Clay pots	22	27.1
Kerosene tins	-	-
Not stated	2	2.5
Total	81	100.0

We need to recognise that there are both modern and traditional modes of water supply in this town, so the respondents were asked to indicate their preference. Despite the difficulties they have in collecting water regularly from the modern source, a significant majority of the people mentioned their preference for the modern pipe borne water system.

Table 3.37 Which Water Source would you prefer?

Preference	Freq.	Perce
Traditional	4	4.9
Modern	77	95.1
Total	81	100.0

The reasons why the majority of the people prefer the modern source were as follows: for health reasons, that the water is medically treated, free from infections and parasitic diseases, that modern water supply is time saving, it is easy to obtain and much nearer to the houses.

Table 3.38 Give reasons for your choice

Reasons	Frequency	Percentage
It is free	3	3.7
Healthy	53	67.9
Traditional is dirty	1	1.2
No rituals	<u>1</u>	<u>1.2</u>
Saves time	3	3.7
Medically treated	17	21.1
Easy to obtain	1	1.2
Total	81	100.0

It is clear from these statements that modern piped-borne water system is preferred. The inhabitants know the real advantages of the system. They are also aware of the health hazards involved in obtaining water from the traditional sources. They stated categorically that they wish to keep the modern system and that the authorities must maintain the system properly for them.

They would like to be involved in maintaining modern water supply. They did not know how to set out specifically to do this. They were not specific in terms of stating their own contribution to maintain the system. As indicated in the preceding table, many of the respondents were at a loss regarding their own specific contribution. Only a few stated that they would wish to maintain the water system by cleaning weeds around the area and the payment of dues. Infact there is no regular mechanism in maintaining any source of water supply in this community. Effective organizational structures are not in existence to effect this desire.

Table 3.39 Community action regarding maintenance

Type	Frequency	Percentage
Clearing weeds	13	16.0
Save water measure in the dry season	-	-
Well and Dams must be constructed	1	1.2
People to be warned against water pollution	6	7.4
Nothing	51	63.1
No idea	6	7.4
Not stated	4	4.9
Total	81	100.0

IX. Myths, Rituals and Taboos

Regarding myths, rituals and taboos, the general pattern was that they are notions of the past. The present generation of educated young men and women do not know about the existing myths, rituals and taboos. Only the members of the older generation indicated that pregnant and menstruating women are not allowed to fetch water from the river side; and that once a year a sheep or goat might be slaughtered to please the river god. It shows the nature and extent of social change in this semi-urban setting. In summary therefore, it must be noted that Bososo is a community with a modern and traditional modes of water supply. Due to lack of proper maintenance and irregularity of the modern system, many of the local inhabitants use the traditional source to collect water from the rivers, Yaya and Boso. It was also discovered that many of the people find themselves in a powerless position and did not think that it was worth trying to report any limitations in the use of modern water supply. They were clearly aware that many of the infectious and parasitic diseases were obtained from traditional source. For these reasons, they wish to obtain water from a modern system. The other important observation was that as a society becomes more heterogeneous and a little urbanized there is a steady decline in rituals, taboos and myths.

X. Community Participation and other Views

In this section we shall discuss respondents views and opinion regarding modern water supply and to find out some of the advantages and disadvantages of both traditional and modern water use. Finally we shall indicate the nature and type of community participation regarding maintenance of modern water system. In this regard it is important to know that 81 household heads were interviewed to express their views towards the principal variables we have mentioned above. As indicated before, Bososo has both modern and traditional water systems. We wanted to find out from respondents if there were any health hazards as a result of drinking from the rivers, Boso and Yaya (traditional modes of water supply). As seen in the accompanying table, the majority of the respondents indicated that many ills were contacted through the use of traditional modes of water supply. Bilharzia was mentioned as one of the principal ills suffered by both adults and

Table 3.40 Ill-effects from using traditional modes of water supply

Ill effects	Frequency	Perc.
Yes	75	92.6
No	6	9.4
Not stated	-	-
Total	81	100.0

children who use the Boso and Yaya rivers. Though there is a modern piped borne water yet due to its malfunctioning the majority of the people depend on the traditional mode to collect water for household use.

Table 3.41 The type of disease contacted

Type of Disease	Frequency	Percentage
Not applicable	3	3.7
River Blindness	5	6.2
Bilharzia	61	75.3
Worms	-	-
Stomach troubles	1	1.2
Headaches	1	1.2
Skin Infections	1	1.2
Not stated	9	11.2
Total	81	100.0

Many of the literate respondents were aware of this health danger, in using traditional water supply, so they resort to boiling of the water. But for the majority of the illiterate respondents they use the traditional source without any further treatment. It was infact confirmed by the local health authorities that bilharzia is one of the principal health hazard in the community as a result of drinking from the rivers.

This disease must be viewed not in isolation. As indicated by many nursing mothers the very young children tend to suffer from ill health, stomach ills and excessive diarrhoea. At the conceptual level, there is evidence to suggest that high mortality and morbidity rates in children, especially within the age group of 0-5, are attributable to using untreated water. Though there are no specific statistics to argue or to confirm the above preposition but from our discussion with nursing mothers and the health authorities, we are convinced that infact such a relationship exists. In addition when one studies, in a comparative sense, rural urban differential death rate, (see Gaisie/¹⁹⁷⁶ one sees clearly that in rural areas the death rate among children is higher than is found in the urban sector. Sai for example attributes this high death rate in the rural areas to insanitary conditions and to infective and parasitic conditions (water borne diseases contribute significantly to these illnesses). The rural people are aware of this problem and the articulate group of them would wish to alter the existing morbidity and mortality rates by asking the authorities to instal an efficient modern water system.

In comparative terms, there is no doubt that the inhabitants are aware of the advantages of modern water system. In terms of health, they know that it is much cleaner to obtain water. The accompanying table shows some of the main benefits to be derived from using modern pipe borne water.

Table 3.42 Advantages of modern Water Supply

Advantages	Frequency	Percentage
Not applicable	11	13.6
Nearness	6	7.4
Easy to obtain	4	4.9
Good health	58	71.6
Employment	1	1.2
For Irrigation	1	1.3
Total	81	100.0

To many of the respondents, apart from seeing to it that the water runs regularly there are no disadvantages with the modern water system. They, however, admit that the present arrangement is not satisfactory and they expect the authorities in town to put pressure on the Water and Sewerage Corporation to rebuild the modern water infrastructural system. On the traditional side, the main disadvantages were that users tend to suffer from bilharzia and other ills. It was also mentioned that it was time wasting and that during the dry season, it was difficult to obtain water.

Community participation is at a low level. Periodic advises were given to children not to waste water. Parents and adults, who live near the standing pipes, make it their duty to advise children to cultivate a judicious sense in collecting water. Other than this, there were no specific community functionaries who were delegated to perform this assignment. The chief was mentioned as the traditional head of the community so he was expected to be responsible in this respect. In a general sense, this situation leaves many undesirable effects.

Table 3.43 Who holds the responsibility to look after water use

Responsibility	Frequency	Percentage
Nobody	16	19.8
The Chief	45	55.6
Town Committee	10	12.3
Ghana Water & Sewarage	1	1.2
Sanitary Inspector	8	9.9
Don't know	1	1.2
Total	81	100.0

The chief does not delegate any one to look after water use. Members of the community assume that it is the responsibility of the chief so they do not bother to get involved in the technical administration of the system. Furthermore the idea of reporting a fault is looked upon in many places as a sign of discontent; so many of the respondents have learnt to show a total disinterest. It is however interesting to note that the new members of the Town Development Committee are beginning to take interest in the water supply system. At present there is the need for an effective organization to direct their focus and to improve the effectiveness of their aims and objectives.

The community members would be willing to pay a stipulated contribution to maintain the modern water system. There were various suggestions but in the main the majority of people would be willing to pay between one to five cedis initially to maintain the system. They would also be willing to pay a monthly dues of $\text{¢}1$ per head of a household. In this community, only very few are rich so the general average contribution is relatively low; but if there is a good regular collection system, an amount of between one to five cedis would make a handsome beginning to build an initial capital fund. The general indication is that the community would be willing to contribute and to maintain the modern water system. But it is important to note that with their

Table 3.44 Distribution by how much money

How much money	Frequency	Percentage
Less than ø1.00	2	2.5
Between ø1 to ø5.00	27	33.3
More than ø5 to ø10.00	19	23.5
More than ø10 to ø15.00	9	11.1
ø20.00	6	7.4
More than ø20.00	3	3.7
Not stated	4	4.9
Not applicable	11	13.6
Total	81	100.0

poor experience with the existing system, they would like to be reassured that the authorities would improve the system. If people are willing to pay to maintain the system they deserve a good treatment. So the **infrastructural** systems must be properly built. Also they argued that it was the responsibility of the central authority to provide them with an efficient modern pipe borne system. They know about their own contribution towards the national fund; and for this reason they expect the government to improve their standard of living by providing them with basic amenities such as pipe-borne water system (see the table attached).

Table 3.45 Who should provide them with water

Responsibility	Freq.	Perc.
Government	60	74.1
Chief & elders	7	8.6
Water & Sewerage	2	2.5
District Council	2	2.5
Town Committee	5	6.2
Self-help	1	1.2
Can't tell	4	4.9
Total	81	100.0

CHAPTER 4: ADULT RESPONDENTS VIEWS REGARDING WATER USE
(NORTHERN REGION)

I. Background of Respondents at Bonyanto

A major thrust of the present study is to explore water availability, water sources and the possible myths and taboos connected therewith, water usage and the attendant problems and benefits. These variables appear to be both interdependent and interrelated. At Bonyanto forty-three household heads were selected and interviewed with reference to these variables of interest. These household heads are all males, and have reached their middle age (Table 4.1).

Table 4.1: Age Distribution of household heads

Age	Frequency	Percentage
35 - 44 years	16	37.2
45 - 54 "	14	32.6
55 - 64 "	8	18.6
65+	5	11.6
Total	43	100.0

A bit more than one-third of them (37.2%) are at least 35 years of age, and almost another one-third of them (32.6%) are at least 45 years old. One out of every ten of them is more than 65 years old. These household heads are all married with large families. For, 86 percent of them claim to have at least eleven children each, and another 11 per cent of them indicate that they have at least five children each. At least one out of every two of them (51.1%) are polygynously married. But almost an equal number of them (47.9%) live under monogamous marriage arrangements. In terms of religious affiliation, the household heads are, in the main, Moslems (58.1%). But at least one out of every three of them (37.2%) practices the traditional religion, and only a very insignificant minority (4.7%) are Catholics. Educationally almost all (95.3%) the household heads have not been exposed to any type of formal education. A very few (4.7%) have had primary school education and these are employed at the neighbouring Danongo hospital.

The rest (95.3%) are self-made farmers. Interestingly the latter group of people enjoy a higher per annum financial income than the former (Table 4.2).

Table 4.2: Distribution by Income

Income	Frequency	Percentage
Ø0 - Ø100	2	4.7
Ø101 - Ø500	4	9.3
Ø501 - Ø1000	12	27.9
Ø1001 - Ø1500	17	39.5
Ø1501 - Ø2000	6	14.0
Ø2000 - Ø3000	2	4.6
Total	43	100.0

Indeed, the income distribution presents a revealing picture of the economic power of the community. The vast majority of this adult population (83.7%) earn at least Ø500 per annum.

At least one out of every three of them earns at most Ø1500 per annum, and an additional small number (14.8%) is within the Ø1501-Ø2000 per annum income bracket. This seems to suggest that the Bonyanto community, by village standards, is an "economic giant". Indeed, the fact that such a small community ably pooled together Ø1000 as an investment towards the supply of modern water systems validates this contention.

In sum, the Bonyanto household heads are illiterate married men with large families. The majority of them belong to the Moslem religion. They are engaged mainly in agricultural activities, and their high financial income testify to the fact that they are also cash crop farmers.

II. Water Use and Habits

It is of immense interest to examine the factors that affect the use of water within our target populations. For water use is a specific type of rational human behaviour. Hence it is a product of many factors that may be both interrelated and interdependent. These factors are likely to be socio-cultural in content.

To study this aspect of the use of water three items in the questionnaire explored taboos in relation to the water source, the main local myths and beliefs pertaining to the source(s) of water supply; and the main rituals pertaining to the source(s) of water supply.

The only existing water source of Bonyanto is five miles away from the village. The principal investigator himself visited the stream, driving some of the distance and walking the rest of the journey. The accompanying research assistants could not recall any taboos about the stream. No religious ritual acts are performed, neither are there any special beliefs and/or myths about this particular stream. These observations were later validated by the household heads in a panel discussion. There is nothing special about the stream; no myths, beliefs and taboos are woven around it.

Apparently, then, there exists no socio-cultural factors affecting both the collection and use of water. There are, however, limiting factors, the most powerful of them being the limited availability of water itself. Additionally, distance is another limiting factor. Hence these two conditions set the boundaries for the collection and use of water. Both the mode and volume of water use are dependent on these two limiting factors. During the rainy season a nearby dam serves the needs of Bonyanto and a neighbouring village. The dry season entails walking a long distance through a hilly environment so as to reach the only available neagre water source. No regulations determine the collection and use of water.

Collection of water for household use is done mostly by female adults (Table 4.3). But a few boys and girls are also actively involved in procuring water for domestic use.

Table 4.3: Distribution by who collects water for household use?

Agent	Frequency	Percentage
Male juvenile	1	2.3
Female juvenile	4	9.4
Female adult	38	88.4
Total	43	100.0

Collection is normally done during the early hours of the day. In fact, some of the respondents complained to the principal investigator that their wives had travelled to the stream as early as 3.00 a.m. Even though this might be an exaggeration, it nevertheless underscores the necessity to collect the water early in the morning. Throughout the night the water slowly filters through the clay springs to form a reservoir. For the early arrivals water is readily available. With the morning collection the supply is usually depleted. The only other time for collection is in the evening.

Table 4.4: Time for Water Collection

Time	Frequency	Percentage
Mornings	37	86.0
Mornings and Evenings	6	14.0
Total	43	100.0

Water is normally collected in locally produced gourds of varying sizes. They have long, narrow top thus making spilling in the course of transportation difficult. The smallest gourd can contain at least a gallon of water; the biggest gourd as many as six gallons. The gourds are also used as storage facilities. For bathing purposes, however, the water is poured into a bucket or a clay pot. Not enough security is taken to prevent foreign objects from falling into the stored water.

It is one of our interests to examine the various ways in which water is being used within our populations of study. With regard to domestic use our respondents were presented with a list of different types of domestic water use and asked to arrange them in their order of priority. The listed usages are: drinking, washing/laundrying, bathing, cooking for household, cooking for commercial purposes, watering plants, construction work, drinking for animals/birds, other (specify). Drinking ranks first in priority, followed by cooking for household, washing or laundrying, bathing, and cooking for commercial purposes in that order. Indeed, almost one-half of the respondents (46.5%) selected drinking as the most important mode of water use and more than one-third (37.1%) of them selected cooking for household.

Table 4.5: Domestic uses of water

Use	Frequency	Percentage
Drinking	20	46.5
Cooking for household	16	37.1
Washing, laundrying	3	7.0
Bathing	3	7.0
Cooking for commercial purposes	1	2.4
Total	43	100.0

Laundrying and bathing are given equal importance, whereas cooking for commercial purposes is given the lowest ranking.

The data invite the observation that water use in this village is limited largely to the basic necessities. Perhaps limited water availability, in itself, imposes limits on the extent of water use even with regard to the basic necessities. As one of our respondents, the head-teacher of the village school remarked one cannot afford to take a bath more than once in three days. And it is just necessary that one keeps one's clothes clean as long as possible! Hence, the frequency of bathing and laundrying is contingent on the availability of water.

In the present case the villagers economize immensely on these two items. This is an interesting reflection on "cause-effect" relationship in terms of availability - use relationship. Stated differently, the mode and extent of water use appears to be a determinant of whether and how much this commodity is available. This observation invites comparative analysis in the light of water use habits of similar rural communities with readily available sufficient water supplies.

With regard to the uses of water outside the house, most of our respondents selected, as the first priority, cooking for commercial purposes.

Table 4.6: Uses of water outside the house

Use	Frequency	Percentage
Cooking for commercial purposes	28	65.1
Bathing	6	14.1
Construction work	5	11.6
Drink for animals and birds	2	4.7
Washing, laundering	1	2.3
Drinking	1	2.3
Total	43	100.0

Next in importance comes bathing. Construction work, drink for birds, washing or laundering, and drinking follow each other in that order. The first chosen priority needs some comment. Bonyanto is situated on the busy Tanale-Damongo road. Cyclists, pedestrians, and buses often stop at the village. There are always women who make cakes, fry yans and other sundries. These food items are patronised by the passersby. This might explain why cooking for commercial purposes has been selected as top priority. Surprisingly a few of the respondents (4.7%) selected drinking for animals or birds as a priority. The village has quite a number of cattle, sheep and goats. Perhaps, most of the respondents thought in terms of purely human needs.

III. Community Participation and other Views

Bonyanto inhabitants suffer from a high incidence and prevalence of guinea worms. Evidence of this is overwhelming. Many also complain of stomach ache. Right or wrong, they attribute it to the unhygienic nature of their drinking water. Their perceptions of alternative water sources and the possible advantages are to be analysed partly against this background.

As stated above, the community has already taken some steps towards the acquisition of modern water supply. A sum of ₦1,000.00 was collected and deposited with the Damongo District Chief Executive. The chief of the village is a dynamic man. He is aided by a village planning Committee. These have largely been instrumental in making representatives to the official sources about the prevailing unsatisfactory water situation, and in collecting the money towards the possible installation of modern water supply systems.

To examine their attitudes towards and perceptions of modern water supplies the respondents were asked questions dealing with their needs for pipe borne water and their perception of the possible advantages of such a system. Hence to the question: Do you want pipe borne water?

Table 4.7: Distribution by Do you want pipe borne water?

Response	Frequency	Percentage
Yes	38	88.4
No	5	11.6
Total	43	100.0

An overwhelming majority (88.4%) answered yes (cf. Table 4.7). Only 11.6 per cent responded in the negative.

One might wonder why as many as 11.6 per cent of the respondents would not opt for pipe borne water. Some of the elders argued for the reactivation of the nearby seasonal dan. Animals would have ready access to the water, so they argued. Unlike the pipe, a dan properly made would not run out of use. Hence the need for a sure permanent water supply and availability of water to animals and birds influenced

the option for a dam by some household heads.

Turning to the consideration of the reasons for opting for pipe borne water, one sees that the reasons are varied. But very many of them (41.9%) think in terms of health and therefore, the need for clean drinking water (cf. Table 4.8). Almost two out of every five of the respondents (39.5%) emphasize easy accessibility to water.

Table 4.8: Reasons of respondents for pipe borne water

Reasons	Frequency	Percentage
It is always available	2	4.7
Time factor, easy to get	17	39.5
Healthy, clean, pure, hygienic	18	41.9
Not applicable	5	11.6
Not stated	1	2.3
Total	43	100.0

Under specific community participation will be discussed responsibility for the maintenance of water supply system and community preparedness and ability to pay for the provision and maintenance of clean pipe borne water.

In the first place, the attitudes of the community members were explored by three questions which asked whether 1. the Community would like to have clean pipe borne water brought to them; 2. whether clean water would improve the health of the people, and 3. whether they would be prepared to contribute to the provision of clean pipe borne water. In each case the response was an absolute yes. The villagers do recognize the benefits of, and desire for clean pipe borne water and are prepared to pay the price. Indeed, the fact that they had already collected some money towards such a project validates their verbal responses. But there is need to examine further the dimensions of community participation in rural water provision and maintenance.

One may state, at the risk of being repetitious, the fact of the willingness of the Bonyanto community both to contribute towards the installation of pipe borne water system, and to pay for its use and maintenance. It is the common consensus that the chief has the responsibility for taking care of water, he is aided by a village planning Committee. These, with the village elders initiate water policies and make the necessary official contacts.

Understandably, the District Council is viewed as the proper agency to supply the village with water. They are all equally prepared to contribute their share of the quota for the government to supply them with water. Again, to the question: Is the community willing to pay for pipe borne water? The response is a universal yes. The only problem is to determine the extent to which they are prepared to participate financially. With a very few exceptions the response normally is "can't tell". Whereas there is the willingness to participate the inhabitants are at the same time, not clear about the extent of that participation.

Table 4.9: Distribution by is the community willing to pay for pipe borne water

Response	Frequency	Percentage
Yes	43	100.0
No	-	-
Total	43	100.0

Table 4.10: How much are you willing to pay?

Amount	Frequency	Percentage
Ø10+	7	16.3
Can't tell	36	83.7
Total	43	100.0

The same response pattern obtains with regard to the personal willingness to participate. For instance all the respondents (100%) answered yes to the question: are you willing to pay for water? But they "can't tell" how much they would contribute. When asked to suggest ways and means for maintaining the water supply most of them (60.5%) suggest regular payment of water rates (Table 4.11). All these data reveal an attitude to make meaningful contribution towards the initiation and maintenance of modern water supply. But the extent to which they are prepared to contribute still remains to be spelt out.

Table 4.11: Suggestions for water maintenance

Suggestion	Frequency	Percentage
Pay water rate always	26	60.5
No wastage	8	18.6
Not stated	9	20.9
Total	43	100.0

It might be of interest to allude briefly to the current community forms of participation with reference to the traditional water source. Periodic cleaning exercises around the stream are undertaken; there have been community efforts at well-digging; care is taken to ensure the flow of the springs and to prevent adults and children alike from stepping into the stream. Such grass-roots community participation augurs well for the community's ability to effectively maintain modern water supply systems to maximise its benefits.

One might raise the important question as to whether the provision of modern pipe borne water would affect the villagers in any meaningful way. Whether social and economic benefits would derive therefrom.

Our Bonyanto household, heads are definitely of this opinion. As one would expect the greatest perceived benefit would be in the area of health. For almost one out of every two respondents (48.8%) emphasized the changes in health conditions which clean pipe borne water could effect.

Table 4.12: Perceived changes pipe borne water can bring to the village

Change	Frequency	Percentage
Healthwise	21	48.8
Time	1	2.3
Cleanliness	3	7.0
Industry	12	28.0
Social	3	7.0
Peace and harmony	3	6.9
Total	43	100.0

A sizeable number (28%) speaks in terms of economic benefits. During our panel discussion with these respondents frequent reference was made for the desirability of dry season gardens. The roadside market and the much larger weekly Saturday market at Danongo provide easy selling avenues. Additionally, quality livestock would result. Obviously, the villagers see themselves not only as healthier people, but also as engaging in economically productive activities if sufficient, clean water is made easily available.

IV. Background Characteristics of Respondents at Kanvili

Eighty married male household heads of Kanvili were selected and interviewed with reference to water use and related issues. The determination of age within a predominantly illiterate population is not at all easy.

Table 4.13: Distribution by age of respondent

Age	Frequency	Percentage
15 - 24	7	8.7
25 - 34	19	23.8
35 - 44	23	28.8
45 - 54	18	22.5
55 - 64	10	12.5
65+	3	3.7
Total	80	100.0

Within the Kanvili community, the age structure of the household heads reveals an overwhelming majority (63.8%) to be within the 35-65 age group. Thus, they belong to the middle age group. Islam is the predominant religion. Almost two-thirds (64.5%) of the population are Moslems. The remaining one-third practices the traditional religion.

None of the respondents has been exposed to any type of formal education. In terms of marital arrangements a remarkable proportion (42%) is polygynously married.

Table 4.14: Distribution if married how many wives

Number of wives	Frequency	Percentage
1	46	57.5
2	27	33.7
3	5	6.3
8 or more	2	2.5
Total	80	100.0

However, monogamous marriage arrangements (57.5%) are more prevalent.

Each household is saddled with a sizeable number of mouths to feed.

Table 4.15: Distribution by respondents' dependents

Number of dependents	Frequency	Percentage
1 - 4	26	32.5
5 - 8	39	48.8
9 -11	10	12.5
11+	4	5.0
Total	80	100.0

Two out of every three of our respondents have at least a family of five children actually living with them. Occupationally, most (8.5%) of our study population are subsistence farmers. And possibly because of its proximity to the town and army barracks, a small group (15%) is also formally employed in various types of paying jobs.

Because of the predominantly non-literate character of this community, the calculation of per annum income is by no means an easy task. Income calculations have to be interpreted in terms of approximations. As expected, the income level of the community cannot be defined as high. A sizeable proportion of the villagers earns between ₦501-₦1000 per annum and almost one-third (31.3%) is within the ₦1001-₦1500 income bracket.

Table 4.16: Distribution by Income

Income	Frequency	Percentage
₦0 - ₦100	1	1.2
₦101 - ₦500	12	15.0
₦501 - ₦1000	36	45.0
₦1001 - ₦1500	25	31.3
₦1500 - ₦2000	5	6.2
Not stated	1	1.3
Total	80	100.0

The inhabitants live mostly on their own farm produce. By and large, the economic condition of the village is such as to support operation costs of basic social services. Modern water supply being the instance of such social amenities. Any inability or failure to support its maintenance costs might be explained with reference largely to non-economic factors. In sum, the Kanvili household heads population is basically agricultural in occupation, and Islam in religion. Illiteracy predominates: families are generally large. By rural standards, however, its economic condition is comparably strong.

V. Water use and Habits

Kanvili has pipe-borne water. Five pumps have been installed at the periphery of the village. The houses are within easy reach of the pipes, however. The most distant house is within ten minutes walk from the pump. All the villagers obtain their water from these sources. Of course, pipe-borne water system is a specific type of modernization of water supply. It represents a new cultural trait introduced into the

traditional society. This diffusion of innovation, responding as it does to the felt needs of the group, and not being inconsistent with the prevailing traditional culture, has been successfully adopted by the village community. There appears to be no cultural inconsistencies with regard to this new trait. In other words, the introduction of modern water system has apparently not produced social dislocations. Nor has the community invested this new cultural trait with its own cultural elements. Stated differently, no taboos, beliefs and myths are associated with this modern system of water source. No special interpretation of it has been made, nor has the community ascribed any sort of supernatural powers to pipe-borne water supply. This system, according to the household heads respondents, performs a very natural function only, but a very crucial one. For the perennial water shortage problem has now been solved.

Both the panel discussions and the interviews touched on certain related problems and difficulties.

Table 4.17: Distribution by difficulties with pipe-borne water supply

Difficulty	Frequency	Percentage
Temporary closure, faulty	14	17.5
Fighting, quarelling over water	9	11.3
Time factor	8	10.0
Not applicable	49	61.2
Total	80	100.0

Temporary turning off of pipes was the recurring complaint. But it is fair to remark that only a minority of the respondents (17.5%) viewed this as a problem. On the contrary, many people from the barracks and Tanale come to Kanvili for water during water crises. In other words, the village enjoys a comparably more stable source of water supply. The village shares its water with one other neighbouring small community.

This, however, creates no significant problems as there is enough water to meet **their** present needs. No rules govern the use or user of water. In a predominantly nonliterate society of the type of Kanvili, division of labour tends to be based on sex differences. Farming is a characteristically male role; all household chores are roles proper to women only. Thus the drawing of water for **household** use is a specifically female role. No man nor boy is meaningfully involved in this specific task. Panel discussions revealed the existence of a strict sex based division of labour, and define fetching of water for household use the proper role of the women. The collection of water is done mostly in the mornings and evenings. The principal investigator has himself observed several morning and evening water collection sessions to verify this contention.

The women use mostly bucket to collect the water. Normally a bucket can contain about two gallons of water. Many also use pans. These are large containers capable of holding as many as six gallons of water. Additionally, gourds and clay pot are used for collection.

The water collection is stored in large clay pots installed within the huts. A large sized pot is capable of holding as many as 30 to 40 gallons of water. Barrels are also used for storage purposes. These are big enough to hold as many as 60 gallons of water. No adequate measures are taken to ensure prevailing hygienic conditions of the stored water.

Within the house itself, water is used for various purposes. Obviously, drinking is the most common mode of water use.

Table 4.18: Distribution by how water is used within the household

Use	Frequency	Percentage
Drinking	61	63.8
Washing, Laundering	10	12.5
Bathing	15	18.7
Cooking for household	4	5.0
Total	80	100.0

Washing or laundering, bathing, and cooking for household are likewise instances of domestic water use. Interestingly, bathing and washing are accorded higher priority than cooking for household and drinking is understandably given top priority. Furthermore, an attempt was made to explore the various ways in which water is being used outside the house.

Table 4.19: Distribution by how water is used outside the house

Mode of use	Frequency	Percentage
Drinking	7	8.8
Washing, laundering	11	13.8
Bathing	33	41.2
Watering plants	13	16.3
Construction work	14	17.5
Cooking for commercial purposes	2	2.4
Total	80	100.0

At least two out of every five respondents (41.5%) selected bathing as the first priority. Apparently, the ready and adequate availability of water created consciousness about the importance of personal cleanliness. This appears to be the most significant mode of extra-domestic water use.

Our target community obviously enjoys modern water supply, and would continue to opt for it. It is healthy, they argue, and has wiped out guinea worm diseases which previously had been very common. However, absolutely nothing is done in terms of safeguarding the water supply.

The environments surrounding the pump are unhygienic. Perhaps, the need exists for educating the community about its communal responsibility vis-a-vis the water supply system.

KANVILI

Community Participation

This section of the study will examine, among other things, the means and ways by which the inhabitants care for their source of water supply, the existing mechanisms for operative responsibility, are the community's financial support for these social amenities.

First organizational structures for water source maintenance.

Traditional societies are characterized functional indifferen-
tiation. Chiefs and elders play a role of central importance within the
society. They exercise control over the behaviour of their subjects
and over resources and benefits. The folk ways and mores of such
societies are self-enforcing. They control behaviour through the
mechanism of habit, conscience and community pressure. The social
status of the chief of Kanvili is central; so it is his ability to
influence the behaviour of his subjects. He is largely instrumental
in the formulation of behaviour norms of the community. Although no
taboos, myths, beliefs, and ritual acts exist with regard to the water
source, the chief and elders regarded as the proper agents for the case
of the water sources. Indeed, their power within the village is pervasive.

Table 4.20: Responsibility for the source of water supply

Agent	Frequency	Percentage
The chief	17	21.3
Elders	27	33.8
Town committee members	1	1.2
Don't know	23	28.7
Nobody	12	15.0
Total	80	100.0

In practical terms, however, no care whatsoever is taken of the village
water source. Pipe surroundings are muddy and dirty, and no regulations
exist for the use and user of water. This suggests the non-existence of
grassroot organizational structure which sees the need for, and/or is
capable of channeling the behaviour of individuals towards the upkeep
and maintenance of this water source.

Turning to the important question of attitudes towards payment for pipe borne water one sees on the part of the community a sense of cautious hesitancy and/or indecision. For instance, to the question as to whether the community is willing to pay for pipe borne water only 23.7 per cent answered yes, and at least three out of every four would not state their positions (Table 4.21). Perhaps, this reticence is based on a misplaced fear or mistrust of the ultimate implications of this study.

Table 2.21: Is your community prepared to pay for pipe borne water

Response	Frequency	Percentage
Yes	19	23.7
No	-	-
Not stated	61	76.3
Total	80	100.0

The same noncommittal attitude is manifested with regard to the actual amount the community is prepared to pay. Only a small minority (14.9%) suggested an amount between one and two cedis. The vast majority of them "can't tell" how much they are prepared to pay.

Table 2.22: How much are they willing to pay?

Amount	Frequency	Percentage
Less than ₵1.00	1	1.2
₵1.00 but less than ₵2.00	11	13.7
Can't tell	68	85.1
Total	80	100.0

In actual fact, each household pays one cedi a month for water. Hence the reluctance to make any statements on this problem. There was the general feeling that the current monthly rate is enough and that, therefore, there is no need either to make any enquiries into it, or for any possible upward adjustment of the present rate. Indeed, the water rate seems to be a sensitive area, for asked for suggestions for a better care of the water source, only one respondent advanced the idea of regular payment of water rates. All the others either "can't tell" or had no suggestions to offer. The data suggest the conclusion of the non-existence, within the community, of infrastructural mechanisms to channelize the behaviour of individuals towards the care and maintenance of the existing water source. Additionally, there is no clear cut indication of the willingness of the community to pay for pipe borne water. In practice, however, payment is being done by the household heads; but one would still expect the community to clearly define its attitude towards this issue. This as the data show, was not forthcoming. However, pipe borne water has effected significant changes mainly in the area of health and, to a lesser extent, small scale gardening. For the previously prevalent water borne diseases such as bilharzia and guinea worms have now been successfully contained; and small scale dry season gardening has likewise been taken up by the inhabitants of the village.

CHAPTER 5: ADULT RESPONDENTS VIEWS REGARDING WATER USE (ASHANTI REGION)

I. Background of Adult Respondents at Kofiase

There were 136 respondents interviewed at Kofiase in Ashanti Region. The sex differential of the sample population was almost evenly distributed; in the sample there were 67 males (49.3%) and 69 females (50.7%); the majority of them were above the age of 35 years of age.

Table 5.1

Age Distribution of Respondents

Age Group	Frequency	Percentage
0 - 14	3	2.2
15 - 24	25	18.4
25 - 34	24	17.7
35 - 44	32	23.5
45 - 54	12	8.8
55 - 64	39	28.7
Not stated	1	0.7
Total	136	100.0

Many of them were illiterate (72.8%). In this context it may be well to draw our attention to the fact that Kofiase is a rural farming village and it has a fairly homogenous village social organization and structure.

Now, **turning to the literate group** of respondents, we find that the majority of them have attained only elementary school education; some of them were **employed as elementary school** pupil teachers and as extension field workers in agricultural work. However the bulk of the population are self employed farmers. Of those found in gainful employment, farming and other extension work, figure prominently. As shown in the accompanying table a significant proportion of them receive between 500 - 1000 cedis annually. This income differential reflects the type of existing low level of income activity in the community.

Table 5.2

Distribution of Income

Income Distribution	Frequency	Percentage
0 - 100 Cedis	32	23.5
101 - 500 "	44	32.4
501 - 1000 "	27	19.9
1001 - 1500 "	11	8.1
1501 - 2000 "	9	6.6
2001 - 3000 "	6	4.4
3001 - 4000 "	-	-
4000+	3	2.2
Not stated	4	2.9
Total	136	100.0

In terms of their religious affiliation, many of the respondents were christians: Catholics, Presbyterians, Methodists, and sympathisers of African religion. However there were few Moslems found in the community. And at the family level, many of the males were household heads and were married with an average family size of between 5 - 8 children. In this relationship, it was usually the case that kinship bond is emphasized in marriage. The implication is that the head is usually surrounded by his relatives.

Table 5.3: Number of persons a household is responsible in his household

No. of Persons	Frequency	Percentage
None	4	2.9
1 - 4	22	16.2
5 - 8	56	41.2
9 - 11	32	23.5
12+	22	16.2
Total	136	100.0

He is not only responsible for his own children but is also responsible for his sister's children and at times other maternal relatives visit his household. In this context, it is relevant to note that many visitors frequent these households and are welcomed to use the existing facilities.

For example, during funerals, which are frequent occasions, many household heads receive visitors from the neighbouring villages and towns. The argument then is that no one must underestimate the actual potential household members. We would put the number of household members, by conservative estimation, to ten. It is a safe calculation.

These background characteristics of the respondents indicate clearly that we are dealing with a relatively homogenous society in which the majority of the people are low income earners, work on the farms and have a large household dependents and unexpected visitors are frequent phenomena.

II. Water Use: Views and Habits

There is no modern pipe borne water in town. The inhabitants use the traditional source. It was pointed out by them that it takes about 20 minutes on the average, to fetch water from this source. This is quite a distance which is about a mile from the nearest household.

Table 5.4: Distribution by how far are the sources of traditional water supply

Distance	Frequency	Percentage
Near 0 - 4 minutes	-	-
For 5 - 20 minutes	46	33.8
Very far 21+ minutes	88	64.7
Not stated	2	1.5
Total	136	100.0

Usually male children and young females are engaged in this activity. They go in groups to fetch water, in the mornings and evenings. Like many other traditional based societies, in Ghana, children and young female adults are mainly involved in fetching water.

Table 5.5: Persons involved in water collection

Persons	Frequency	Percentage
Male Adults	2	1.5
Female Adults	6	4.4
Male Juveniles	1	0.7
Female "	1	0.7
2 and 4	4	2.9
3 and 4	31	22.8
5 and 6	82	60.3
Other Combinations	7	5.2
Not stated	3	2.2
Total	136	100.0

Usually water is carried in buckets and tins. Each container carries about 4 gallons of water. The very young carry about 2-3 gallons of water, according to size and weight of the child. In the final estimation about 30-40 gallons of water is stored and used by an average household (of about 8-10 persons). In almost all the households, barrels are kept at strategic points for this purpose. During rainy seasons, rain water is also collected into these barrels. Many of the enlightened homes cover these containers but by and large they are not usually covered.

Turning to uses of water, the main uses were, for drinking, bathing, cooking and washing purposes. In terms of cooking, household cooking takes a lot of water and at times water is used to cook for commercial purposes. Water stored in the house is not usually used for construction or for farming and irrigation purposes. Those involved in construction work, collect water directly from the streams in the community for their own use.

On washing days, which usually take place on Sundays and Tuesdays, young girls tend to fetch more water for this purpose. More water is needed for washing and for this reason many adult females give a helping hand.

Respondents were asked if they did experience difficulties in obtaining water for household use. Infact, almost all the respondents indicated that there were several difficulties: fighting to get water, time factor, water shortage and unnecessary arguments regarding whose turn it was to fetch water, were enumerated as some of the common factors of inconvenience.

Table 5.6: Do respondents have any difficulties

Distribution	Frequency	Percentage
Yes	131	96.3
No	1	0.7
Not stated	4	3.0
Total	136	100.0

It was also mentioned that there were periodic shortages, during the dry season. In this season some people had to travel to nearby villages (about 4 kilometers away) to fetch water. It is quite obvious that this is a source of inconvenience. It was however indicated that such occasions did not last long. With frequent rains the position is reverted to normal within a matter of a week or two.

Table 5.7: Types of difficulties experienced by respondents

Difficulties	Frequency	Percentage
Fighting/quarelling for water	42	30.9
Time factor	60	44.1
Dirty water	1	0.7
Water shortage	27	19.9
Not stated	5	3.7
Not Applicable	1	0.7
Total	136	100.0

Some of the respondents also indicated that even during the dry season, when their community experiences water shortage, they did not travel outside to fetch water because of the distance and the inconvenience it causes. What they do is simply to rely on their own poor source of supply; though they admit there is time wasting and the unpleasant feeling of drinking impurities. It is precisely because of these reasons that many of the younger group of respondents go outside their village to collect water. Committee members were cautioned by the chief and his elders in town not to allow their wards to waste water, especially during the dry season.

III. Taboos, Rituals and Myths

The respondents mentioned that there were taboos, rituals and myths regarding water use. Turning to taboos, the older inhabitants were aware of the dangers of walking with their footwears on in the river; they were also aware that no one is allowed to swim in the river and that menstruated women are forbidden to go near the river. It was also dangerous for the individual to fetch water at night. We may note that

many people especially of the younger generation were not very much aware of the existence of many of these taboos. The interpretation one can give is that the magical connotation of these taboos have been eroded with time vis-a-vis social change.

Table 5.8: Statement of existing taboos

Type of Taboos	Frequency	Percentage
No light at night	2	1.5
Menstruated women not allowed	5	3.7
No footwear/swimming	52	38.2
No smoking	3	2.2
Don't know	20	14.7
Not stated	46	33.8
Total	138	100.0

Turning to rituals, the majority of the respondents indicated that an annual slaughtering of sheep, goat or fowl is an event which is adhered to, in this day and age, to purify the river god. Also, seasonally libation is poured by the chief and his elders to thank the river god for its protection and the provision of good service to the community. Almost always, rivers are looked upon by traditional people to possess personalities of their own. For this reason the local inhabitants tend to pay their respects to existing rivers on certain occasions.

Table 5.9: Distribution of main local rituals

Rituals	Frequency	Percentage
None	12	8.8
Seasonal pouring of libation	21	15.4
Annual slaughtering of an animal	99	72.8
Don't know	2	1.5
Not stated	2	1.5
Total	136	100.0

In terms of the existing myths and local beliefs, many of the inhabitants, especially the illiterate folks, look upon the river as a god; and that it must be worshipped, respected and that one must be in good relationship with it. It is more or less regarded as the "mother" of the community, through whose generosity the village owes its existence. It is precisely in this direction, that one witnesses the intricate nature of the interrelationship between myths, rituals and taboos.

In summary, the observation in Kofiase is that people experience some difficulties in obtaining water, especially during the dry season. Their need is for a continuous water supply, a system which could be efficient during all seasons. In this direction we shall look at their views regarding the type of contribution they would wish to make to get pipe water.

IV. Community Participation and other views

Respondents were asked to indicate whether they suffer from any ills as a result of using water from the existing traditional source. About 82.4% of the people confirmed that there were many ill effects. In this direction, as shown in the accompanying table, the respondents were really disturbed that many of their ills were attributable to the fact that they were using traditional source of untreated water.

Table 5.10: Types of ills prevalent

Type if ills	Frequency	Percentage
Not applicable	20	14.7
River Blindness	24	17.6
Bilharzia	-	-
Worms	13	9.6
Stomach ills	27	19.9
Pains	31	22.8
Boils	1	0.7
Other Infections	9	6.6
Not stated	11	8.1
Total	136	100.0

They were of the opinion that with modern water system many of the above mentioned ills would be eliminated. From this point of view, they have petitioned the central Government on many occasions, to extend modern pipe borne water system to their area. To them, the Government is responsible to provide them with clean water.

Table 5.11: Action taken by the Community

Action taken	Frequency	Percentage
Petitioned Government	128	94.1
Ghana Water & Sewerage	1	0.7
Town Development Committee	2	1.5
Can't tell	1	0.7
Not stated	4	3.0
Total	136	100.0

Turning to specific rules and regulations regarding water use, the observation was that there were no specified stipulated community rules except for the occasional attempts on the part of parents and adults to advise their children to use water carefully; and that water should be used only for domestic purposes especially during the dry season. At times, members of the village development committee mobilize the youth to resort to clean up campaigns. It is within this general context that some youth go to the river side to pick up debris and other wastes near the river beds.

Table 5.12: Measures taken to clean water source

Measures	Frequency	Percentage
Dipping out weeds from river bed	32	23.5
Keeping watch for misuse	5	3.7
Temporary clean up campaigns	94	69.1
Don't know	1	0.7
Not stated	-	-
Total	136	100.0

Infact there is not a well known constituted body to see to the maintenance and cleanliness of the traditional water source. As specified by the respondents, it is only at times that committee members in the village do mobilize the youth to resort to these ad hoc measures of clean up campaigns. Many of the respondents mentioned, over and over again, that many of their problems would be minimized if they could get piped borne water. And to this end they were of the opinion that a well-constituted body could be established to see to the day to day running and cleanliness of the water source. They were willing to pay between one to five cedis as an initial contribution to get modern piped water. Regarding its regular maintenance and usage, they indicated that a fixed sum of one cedi per household should be collected monthly as water rate. They think this is a fair arrangement.

Table 5.13: Specific contribution by Community Members

Contribution	Frequency	Percentage
Between 01.00 - 05.00	37	27.2
Between 05.00 - 10.00	2	1.5
Between 10.00 - 15.00	11	8.1
Between 15.00 - 20.00	1	0.7
Between 20.00 - 25.00	9	6.6
More than 25.00	4	2.9
Not applicable	-	-
Not stated	72	53.0
Total	136	100.0

It is also important to note that a significant proportion of the respondents did not commit themselves (see above table) in terms of how much they would be willing to give. It was noted that most of these people were in low paid jobs and were also dependant upon family heads. Perhaps the main reason was that they did not have any independent financial means of support. On the whole, however, the respondents were quite keen in mobilizing contributions and to ask the Government to install a pipe borne water system. From this analysis, it should at least be clear that members of this community are infact willing to contribute to the initial installation cost and they were also willing

to make a monthly contribution to maintain the system.

They were also asked to give suggestions on the mechanics of maintaining the system. The main suggestions (see Table 5.14) were that, they would be willing to delegate someone to hold the responsibility to report any defect in the system to the right authorities. They also mentioned that they would clean the surroundings weekly, make regular repairs (cementing the area) and would see to keep waste matter from the area.

Table 5.14: Suggestions to maintain the System

Suggestions	Frequency	Percentage
No Suggestions, Don't know	55	40.4
To report fault	5	3.7
Pay regular rate for repairs	15	11.7
Weekly cleaning of area	15	11.0
Proper adherence to water rules	9	6.6
No wastage to be deposited	28	20.6
Not stated	9	6.6
Total	136	100.0

The respondents also mentioned some of the reasons why they wish to get a modern water system. As usual, health reasons figure prominently among many of the reasons they put forward. They stated categorically that by their notion of modern water supply they mean piped borne water.

Table 5.15: Reasons for modern water system

Reasons	Frequency	Percentage
Health reasons	72	53.0
Existing traditional source: unclean	38	28.0
Time saving	2	1.5
Medicated and treated	1	0.7
Easy to obtain	15	11.0
No taboos	4	2.9
Employment opportunities	1	0.7
Not stated	3	2.2
Total	136	100.0

They were also of the opinion that modern pipe borne water would alter their style of life, by lowering mortality and morbidity rate, improving sanitary conditions and that it would be time saving to collect water from standing pipes.

In summary, it should be noted that the inhabitants at Kofiase are not satisfied with their traditional water source and would willingly like to make some contribution to induce the central Government to expedite their call to install modern pipe borne system. They were also of the opinion that the existing traditional source is not save enough for health reasons.

NSUTA

Social Characteristics of Household Heads

The total interview sample of Nsuta household heads consisted of 126 respondents. Of these 52.4 per cent were men and 47.6 women.

Table 5.16: Distribution by Age

Age	Frequency	Percentage
0 - 14	16	12.7
15 - 24	49	38.9
25 - 34	17	13.5
35 - 44	21	16.7
45 - 54	8	6.3
55 - 64	15	11.9
Total	126	100.0

At least two out of every three (65.1%) are less than 35 years old; the rest (34.9%) are at least 35 years old. This household heads population is generally young. The greater proportion (61%) of this sample have had some level of formal education. The remaining 39 per cent are illiterates. Among the literate are differences in achieved education levels. (Table 5.17) However most (32.5%) are middle school leavers.

Table 5.17: Distribution by educational standard

Educational level	Frequency	Percentage
Primary School	1	0.8
Middle School	41	32.5
Secondary/Commercial	15	11.9
Teacher Training	17	13.5
Sixth Form education	3	2.4
University	1	0.8
Not applicable	48	38.1
Total	126	100.0

Teachers and Secondary school leavers combined also represent a sizeable proportion (25.4%). The educational background of the community is reflected by its occupational structure, for 41.3 per cent are gainfully employed and the remaining 58.7 per cent are self-employed mainly in the agricultural sector. Obviously the general income will be influenced both by education and occupation.

Table 5.18: Distribution by Income

Income	Frequency	Percentage
0 - 100	4	3.2
101 - 500	17	13.5
501 - 1000	32	25.4
1001 - 1500	27	21.4
1501 - 2000	27	21.4
2001 - 3000	14	11.1
Not applicable	5	4.0
Total	126	100.0

The income distribution demonstrates the somehow heterogenous character of the villager. By rural standards, an income of ₦1000.00 or less is definitely low; ₦1001-₦2000 is considered as medium and anything above ₦200.00 could be considered high income. Thus only 11 per cent of the household heads can be said to be earning a somehow high income; almost forty-three percent fall within the medium income group and the rest (42%) are low income earners. (Table 5.18) In terms of religious affiliation, the community reflects a mixture of several religious groups. Presbyterians compose the single largest group (27.8), followed by Catholics (15.1%), Anglicans (14.3%), Methodists (12.7%) and Moslems (2.4%) the rest (27.7%) belong to other unspecified religious groups. At least one out of every two of the respondents (52.4%) is unmarried, and 48.6 per cent are married mostly monogamously. The average family size is large. Three out of every five of them have a family size of 1-4 children; a significantly large proportion (20.6%) have a family size of 5 to 8 children.

The Nsuta community, then, is more or less heterogenous in terms of occupation, education and religion. Economically, the village appears to have the necessary economic potential to meet operation costs of valuable social services.

Socio-Cultural Factors affecting water Use

This section will focus mainly on the cultural determinants of water sources and water use. Nsuta has pipe borne water. It is also served by a not-too-distant stream. Owing to frequent breakdowns, closures and turning off of water, the pipe borne water source is not dependable and fails to serve the community satisfactorily. Hence the inhabitants supplement this source by collecting water from the stream. Nondependability of the pipes is the major complaint; this constrains the inhabitants to turn to the stream as the alternative source of water supply.

Collection is done mostly by female adults, though male and female juveniles are also involved in the collection exercise. This is done throughout the whole day. But the mornings and evenings are the busiest water collection hours. Mostly buckets are used for collection and transportation of water. Kerosene tins are likewise used. Within the house itself, water is stored in huge barrels capable of holding as many as 100 gallons of water.

The household heads, being the preservers of custom were asked about the various cultural practices vis-a-vis these sources of water supply. No evidence exists about myths and beliefs concerning the water sources; neither are there any taboos with respect to these same sources. Only one respondent made reference to the seasonal pouring of libation, and another three alluded to the slaughtering of animals and birds by the source. The weight of the data tilts in favour of the absence of myths, rituals and taboos. Hence the collection and use of water is not dependent on cultural factors. If anything, situational factors may be ultimately explanatory of water use within our target populations.

Asked to list in an order of priority the various domestic uses of water, a remarkable proportion of the respondents (70.6%) selected, as first priority, drinking (Table 5.19). Almost one-quarter (23.8%) selected washing/laundry; a very few selected cooking for household and bathing. But with reference to water uses outside the household,

Table 5.19: Domestic Uses of Water

Use	Frequency	Percentage
Drinking	89	70.6
Washing/Laundrying	30	23.8
Bathing	1	0.8
Cooking for household	6	4.8
Total	126	100.0

most of the respondents (51.6%) recognized washing or laundering to be priority. (Table 5.20). This is followed by bathing, Cooking for household, drinking and watering plants in that order.

Table 5.20: Uses of water outside the household

Use	Frequency	Percentage
Drinking	12	9.5
Washing/Laundrying	65	51.6
Bathing	30	23.8
Cooking for household	16	12.7
Watering plants	2	1.6
Total	126	100.0

Thus personal cleanliness is a priority with regard to extra-domestic water use. The community prefers pipe borne water because it is clean, readily available and thus saves time. Additionally the advantages of pipe borne water have been perceived as the eradication of water borne diseases and easy accessibility to good, clean water. However, temporary closures have also resulted in the death of livestock. This is recognized by many respondents as the most crucial disadvantage of the pipe borne water supply system.

Community Participation

Discussion of community organizational components has direct or indirect relevance to our subject of interest. In this connection examination will be made of whether how and by what means the community expresses or is prepared to express a certain amount of responsibility towards the provision and maintenance of pipe borne water source.

This discussion might be prefaced by the recognition of a total absence of regulations for use and user of water within this community.

Responsibility for caring for the water rests with the Town Planning Committee members. Others even ascribe this role to the Water and Sewerage Corporation. In other words, there is no effective superstructure for the care and maintenance of water within this community, despite the vague assertion that children are prevented from wasting water and that some amount of cleaning around the reservoir is done. This absence of superstructural basis of community responsibility for the existing water source definitely suggests social education in that direction - a task that can easily be performed by competent social workers.

The question of whether or not the community is willing and prepared to pay for pipe borne water presents a different picture. There appears to exist a definite tendency, despite the unsatisfactory experience of modern water system, to pay for pipe borne water.

Table 5.21: Is the Community prepared to pay for pipe borne water?

Response	Frequency	Percentage
Yes	118	93.6
No	2	1.6
No answer	6	4.8
Total	126	100.0

For pipe borne water has definite advantages. It is clean, hygienic and healthy. Moreover it is readily available. With these advantages in mind, the community manifests a clear readiness to contribute the necessary financial share for services and maintenance purposes. The individual community members are likewise willing to pay. In concrete terms, one out of every four of the inhabitants are prepared to pay between two and three cedis, and a comparable proportion (23.9%) would be willing to pay at least two cedis. There are a very few (1.6%) who would pay over ten cedis. That there exists a willingness on the part of the inhabitants to pay for pipe borne water is abundantly clear

from these data. There is a manifest attitude to cooperate financially for the maintenance and services for pipe borne water.

Table 5.22: Distribution by if yes how much?

Amount	Frequency	Percentage
Less than ₱1.00	16	12.7
₱1.00 - ₱1.99	14	11.1
₱2.00 - ₱2.99	32	25.3
₱3.00 - ₱3.99	20	15.9
₱4.00 - ₱4.99	7	5.6
₱5.00 - ₱5.99	5	2.4
₱10.00 and over	2	1.6
Can't tell	10	7.9
Not stated	22	17.5
Total	126	100.0

Indeed, regular payment of water rates is one of the suggestions offered for the maintenance of the water supply. Perhaps, **this** attitude is a reflection of the actual perceived changes pipe borne water has effected in the life of the village. This is the more so in the vital area of health.

Table 5.23: Changes brought by pipe borne water

Change	Frequency	Percentage
Healthwise	106	84.1
Time	8	6.3
Cleanliness	6	4.8
Industry	2	1.6
No answer	4	3.2
Total	126	100.0

Water borne diseases like bilharzia and guinea worms had previously been common. The currently almost nonoccurrence of these same diseases since the introduction of modern water systems would appear to testify to this health benefit. This is the single significant change brought about by pipe borne water to the village community.

Although there appears to be no definite community participation for the care of the existing system of pipe borne water, the inhabitants are willing to pay for the water as they see its overwhelming advantages. The expressed wish of the community is for improved services and, consequently, to maximise the use of water.

Chapter 6. Summary and Conclusions

I. Introduction

The main objective of the study was to conduct a social survey, to find out from rural people some of their views and habits regarding water use. Related to this objective we set out to explicate socio-cultural factors affecting water use, to determine the type of participation people are willing to give to maintain a modern water supply and finally, to give a sociological comparison between traditional and modern modes of water use.

The intention was to study all the rural communities in Ghana so that a meaningful insight could be obtained from the findings. In this context however, as a result of time constraint and also from our knowledge of probability sample theory we were able to select six communities which could give meaningful findings, in terms of generalization and to satisfy our original intention. Three geographical cum cultural areas were selected, the northern regional belt, the Ashanti forest belt and the Southern Savana area. Also as noted from the objectives stated in the introductory chapter, there was the need to determine the nature of the relationship between traditional modes of water supply and the modern system in order to explicate the determinants of the pattern of articulation.

In each area therefore, one community with modern water supply and another without were selected to form the basis of compiling comparative data. The probability sampling procedure was adopted to select the houses and the final respondents in all the six communities (Adubiase, Bososo in Eastern Region, Kofiase, Nsuta, in Ashanti Region, and Dunyarto and Kanvili in Northern Region). The period of field work lasted six weeks, from January to the middle of February 1977, after which statistical data were computer programmed, through coding and punching procedures. In order to approximate a significant level of reliability and validity in the data, we interviewed children for their views and also adults for the presentation of their views. These procedures helped us to collect reliable and valid data. The writing of this report was completed by the end of May 1977.

II. Findings: (1) Children were found to play a significant role in fetching water for household use. This observation includes both male and female children, usually between the age range of 7-14 years. This observation needs some qualification in the Northern Region, as the data from Kanvili and Bonyarto indicate, girls and women are responsible for fetching water. (2) Water is mainly obtained from both traditional and modern sources in the mornings and evenings. It was not usually the case for people to fetch water in the afternoons. (3) These sessions, mornings and evenings can be termed as rush hour sessions. Many difficulties were met with: (a) those communities which had modern standing pipes had difficulty in obtaining water. The water pressure was very low and the respondents were not at all sure whether the water would be obtained from the standing pipes. At times the opening periods were so irregular and unpredictable. The period of opening was limited to some few minutes, when most of the people have given up hope or have retired to their farms. As a result of this observation with modern pipe borne water, children and other female adults are duty bound to go as early as 5.30 am to fetch water. (b) With regard to the traditional source, the morning and evening periods were set aside to collect water. The difficulty, in this relationship is not of kind but of degree. Usually those who go early are able to get water with little difficulty. Furthermore in the dry season, it is more difficult for users of traditional source to obtain acceptable drinking water. However, the respondents indicated repeatedly that at least the traditional source was available and predictable in behaviour. (c) This was not to say that they were satisfied with the traditional source but rather to argue for an improvement in the quality of service of modern pipe borne water system. (4) By the concept modern water system, they were more familiar with standing pipes. They were of the opinion that pipe borne water is of better quality because of its treatment. (5) As indicated by a great majority of the people, both in places with and without modern water supply, traditional source of water poses a great health risk. Water borne diseases are frequent (guinea worms, bilharzia and other parasitic and infectious diseases). For health reasons they would prefer modern pipe borne water because if properly established, it is much easier

to obtain in terms of distance. (6) It was noted that far distance is one of the reasons why many people do not advocate for the maintenance of traditional mode of water supply. On the average some functionaries travel between 1-4 miles to fetch water. The process was found to be cumbersome and indeed a tiring one. In other words they were of the opinion that with modern water supply they would be able to concentrate on more productive activities. (7) In terms of uses of water, the main uses were for drinking, cooking, washing and bathing purposes - household consumption. An average household, of about 6 members, uses 30-40 gallons of water per day. A child uses 3-4 gallons and an adult uses about 6 gallons a day. (8) Water is collected with tins, buckets and gourds and stored in barrels, some of which may be covered. Mostly we can say that these containers could be sources of infections. As a result of uncertainties and other difficulties there is also an element of water hoarding. The danger with this exercise is the unhygienic nature of the storage places. (9) That in communities where water is easily obtained more water is consumed by household members. In other words determinant of water use is its availability. (10) That the people in the rural areas are very clean people irrespective of their social characteristics of the people (literate and illiterate, occupation etc.) There was no remarkable difference between their water habits so that it should not be expected that they use less water than urban dwellers because of less hygienic habits. If given the opportunity (in terms of available water) they can be just as hygienic. (11) It was found out that there were no specific rules and regulations, myths, taboos and rituals regarding modern water use. In the areas where the inhabitants rely on traditional source, many old people still maintain certain myths, rituals and taboos. In other words as societies move from purely traditional to modern forms the effects of myths, taboos and rituals are considerably de emphasized. (12) In places where there were modern standing pipes, people were not inclined to report to the right authorities, if they were not functioning. The explanation given was that of mis-interpretation; that the reporter is a rude person and cultivates disrespect to his elders. For these reasons there is a general feeling of apathy among many of the people. (13) In many places, there is the hope that

village/town development committees are willing to take this responsibility.

(14) Community members indicated willingness to pay for water. They estimated a monthly water rate of about one cedi per household. They were also willing to contribute an initial sum of between one to five cedis to help the authorities to instal a modern pipe water system.

(15) They would like standing pipes within a distance of not more than 7 minutes walking distance from their houses. (16) The inhabitants in all the communities indicated that they want pipe borne water and shallow wells equipped with hand pumps, water supply based on surface water from rivers, lakes or small ponds including sedimentation tank or slow sand silter. If these are "treated" water they would accept. These are some of the possibilities that could be explored as alternatives to standing pipes. The best people to be approached are the members of the village/town development committee. The village/town chief is almost always a member of this committee. (17) Villagers associate high mortality and morbidity rates of (especially) children to poor water supply. To them a modern water supply system would help to lower mortality and morbidity rates. The obvious implication is that they would bear less children, if the psychology of uncertain death of the young is removed. Fewer children would improve the productive earnings. As indicated by Selma and Mushkin (in the article "Health as an Investment" see Journal of Political Economy, Vol.70, 1962 pp. 129-57) environmental health programmes including safe water supplies were seen to be largely responsible for the decline in death rate in the United States, between 1900 and 1917. We strongly suggest that there is a positive relationship between poor water supply and high death rate. With the provision of modern water, the welfare of the rural people would be affected in a positive way.

III. Summary of the Findings

Objective: Socio-cultural factors affecting the use of water. Three geographical cultural areas were studied. These areas were selcted in the hope that we might discover regional differences, cultural, ethnic or other social variations, if any, with regard to water use. It was discovered that no specific regional differences exist. Infact with the supporting

facts and figures we were able to determine that in all the communities the pattern of water collection, storage, usage and the norms regarding them were similar. It was only in the Northern region that we discovered that males were not involved in the collection of water. Water collection exercise therefore was mainly the function of young adult females. It was also found that in urban or semi urban areas with pipe borne water supply, the inhabitants did not hold myths, taboos and rituals in any rigid fashion. In small isolated communities, only the older population knew about them. Even in this case the performance of rituals was done by the chiefs and their elders. In summary therefore, we can say that in Ghana, in this day and age, there is cultural homogeneity regarding water use - similar views and habits were observed. We did not find any important regional differences regarding water use, habits and views.

Objective 2: Sociological Comparison between Traditional and modern modes of water use

In communities where the inhabitants use the traditional modes of water supply, they were dissatisfied with the system: time wastage, health hazards and cumbersome procedures were cited as some of the difficulties. Because of these difficulties they were asking for modern water supply. They were of the opinion that modern water supply is clean and easier to obtain. To them they would be willing to use either hand pump (modern water system) or pipe borne water(modern water system). The other important point often repeated was that traditional source is unhygienic and that many of their ills, especially mortality and morbidity problems, can be traced from the use of traditional (untreated) water supply. It is precisely in this direction that they are asking for any type of modern (treated) water supply.

On the other hand, the users of modern water supply would like to see some fundamental improvements in the system. They were aware of its enormous advantages; economy in time, hygienic conditions and free from parasitic and infectious diseases. However they were dissatisfied with the present arrangement of irregularity, uncertainty and non functioning of some of the standing pipes. The dams tend to be shallow and poorly constructed.

In summary therefore all the communities are asking for modern water system. They are asking for pipe borne water supply, they are also asking for hand pumps. These pumps should be installed for approximately every 300 persons in the community or neighbourhood. In other words in a community of 2100 people, at least viable hand pumps (situated in strategic places) would satisfy the aspirations of the people. Those who have pipe borne water supply would wish to see structural modification in the system (to make them work properly). These findings are not different from the statements made from the findings of Tahal Consulting Engineering (Tel-Aviv, Israel) in January 1977. We find their document a useful one, especially on the "design criteria" (refer to the reference section of this report). Also in a given neighbourhood, the inhabitants indicated that 4 to 7 minutes walk to a pump or to a pipe would be a satisfactory arrangement. Tahal group of Engineering Consultants estimated a 4 minutes walk. We would agree with this time estimation. The last observation was that people use more water from a modern water source. So we need to make an allowance in water use. It is in this direction that we suggest 6 gallons per head and that in an average small household 30-40 gallons should be the estimated allocation. We found the mornings (5 - 8 a.m.) and the evenings (4 - 6.30 pm) to be rush hours. For these observations future planners must take note.

Objective 3 & 4: The type of Community Participation and Willingness to pay

We found that there were no specific functionaries or organizing bodies whose main function was to maintain the use of water. This brought about unsatisfactory issues. Problems of maintenance, providing feedback information and general cleanliness of water usage were lacking.

The general reaction of the people in the surveyed communities was that they would wish to take active part in maintaining modern water system in their eagerness to get treated water. They gave the following specific suggestions (1) that a specified tax of one cedi per household should be levied per month to maintain the system. (2) that they were willing to pay between one to 5 cedis (in some cases about 10 cedis) per

person to form an initial capital to help the Government in installing modern water system. (3) that the village/town development committee should be responsible for general overseeing of the system, in terms of maintenance, reporting and cleanliness, we observed that there is a willingness to pay for modern water use. To encourage this positive attitude it is important for the water authorities to note that an efficient system is what the public is asking for. If it is maintained the habit of paying would be encouraged, and that the village/town development committee must also be involved in the total process, of maintenance and reporting deficiencies.

Objective 5: Socio-economic benefit

The general consensus of opinion and views was that the people would be better off socially and economically with the use of modern water supply. Being a less cumbersome system the users of modern water supply would be able to concentrate on productive activities most of the day. It was also noted that old customs, myths and taboos tend to be pushed into the background of activities in communities where modern water supply exists. It means that the social situation takes on a different turn in places where we have modern water. Socially, the returning migrant feels at home. The health of the community would be improved, children would have a better chance of survival and the general mood of the community would be activated. Women engaged in soap making, oil processing and other related small scale industries would get water.

It is also interesting to note that the rural folks are aware of the high rate of infant mortality and they associate this with poor water supply. As a result of this awareness, they have cultivated a certain attitude of mind to produce more children so that in the final analysis, of one's procreative period some of the children might still be alive. This is the built in psychology of the mind of the people in a situation where children suffer, due to infective, parasitic and malnutritional ailments. So with treated pipe borne water, it is strongly believed that the rural folks would have an attitudinal change of mind vis-a-vis low fertility rate. Throughout the survey almost all the adult respondents held the view that many ailments were contracted through the use of untreated water (traditional water supply). And children suffered

severely due to the fact that they have not developed resistance to infective and parasitic diseases. With good water supply, many people would be able to take proper care of their children and this would enhance their life style. In this day and age, many parents, in both rural and urban areas, send their children to school. It costs highly to educate many children. Therefore there is the hope that if parents are aware that the few children they produce would live, they would be relieved of many hardships of this nature. Furthermore children are wanted to help old parents to manage their houses, to fetch water etc. With modern water supply, the style of life of parents would take a different turn. Real self help would be cultivated in more matters. It must therefore be clearly stated that a viable modern water system would go a long way to improve the social and economic status of the people in rural Ghana.

Recommendations

- (1) For health reasons, rural communities desire modern water supply. It is unsafe for people to rely on untreated water, in this day and age.
- (2) That in fairness, if communities are willing to pay basic rates to maintain a modern water system, village/town development committee must be responsible to collect the rates. (3) To sustain the interest of the people, water must be seen to be available during the rush hour sessions - in the mornings and evenings. (4) That standing pipes should be placed in strategic points in a given community, the farthest should not be more than a 7 minutes walking distance from the furthest recipient. (5) That social change can be effected in rural communities with the provision of a modern water system.
- (6) As it is a recognised fact that children resort to petty quarrels and play at the water source, any future project should build a semi enclosure or a queing panel to institute orderly behaviour. This may eliminate congestion. After one's turn he goes through the other end. (7) That bathrooms must be built near such places. Because it is recognised that some children tend to take their bath at the water source. Nothing elaborate, but a series of walled enclosures. (8) That there is the need to inculcate community involvement and the spirit of participation. A body must be established, if even it is the responsibility of a particular person to see to the day to day management of the place. Cleanliness would be maintained and we can

avoid pollution to a large extent. (9) That where a modern pipe borne water is installed proper installation resource must be used. It must be opened on a daily basis. If for some technical reasons it is not possible, at least water users must have full use of it in the mornings and in the evenings. It is due to its improper maintenance and its technical installation defect that makes community members dissatisfied.

(10) The pipes should be made easily operationable by children of a relatively young age, and also hardy enough to stand abuse from youngsters.

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