

KILIFI WATER AND SANITATION PROJECT

P.M. 86.2536.0 - 01.600

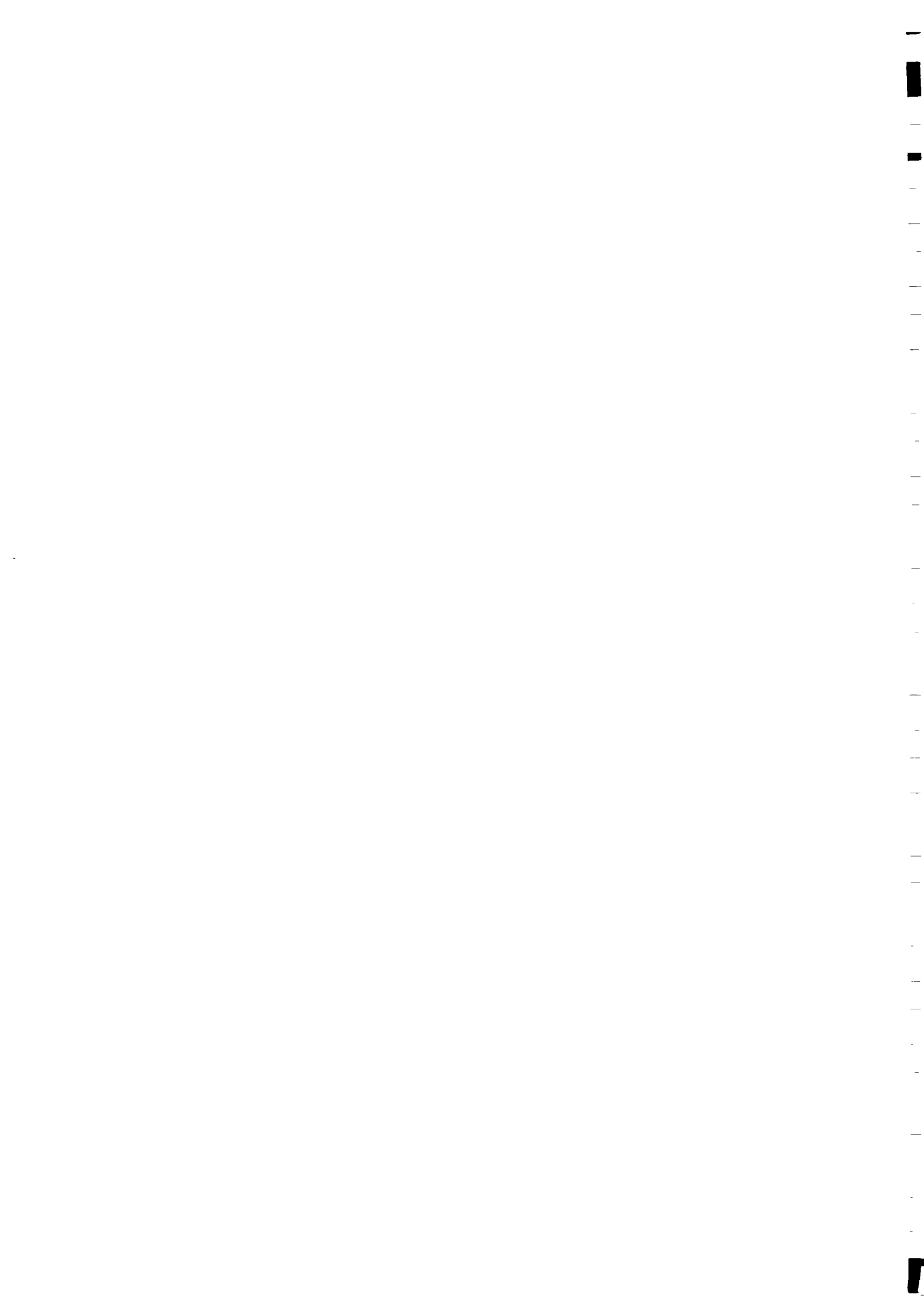
**REPORT ON
SAMPLE SURVEY TO ESTABLISH
BASIC PARAMETERS (INDICATORS) FOR MONITORING
AND EVALUATION OF PROJECT IMPACT**

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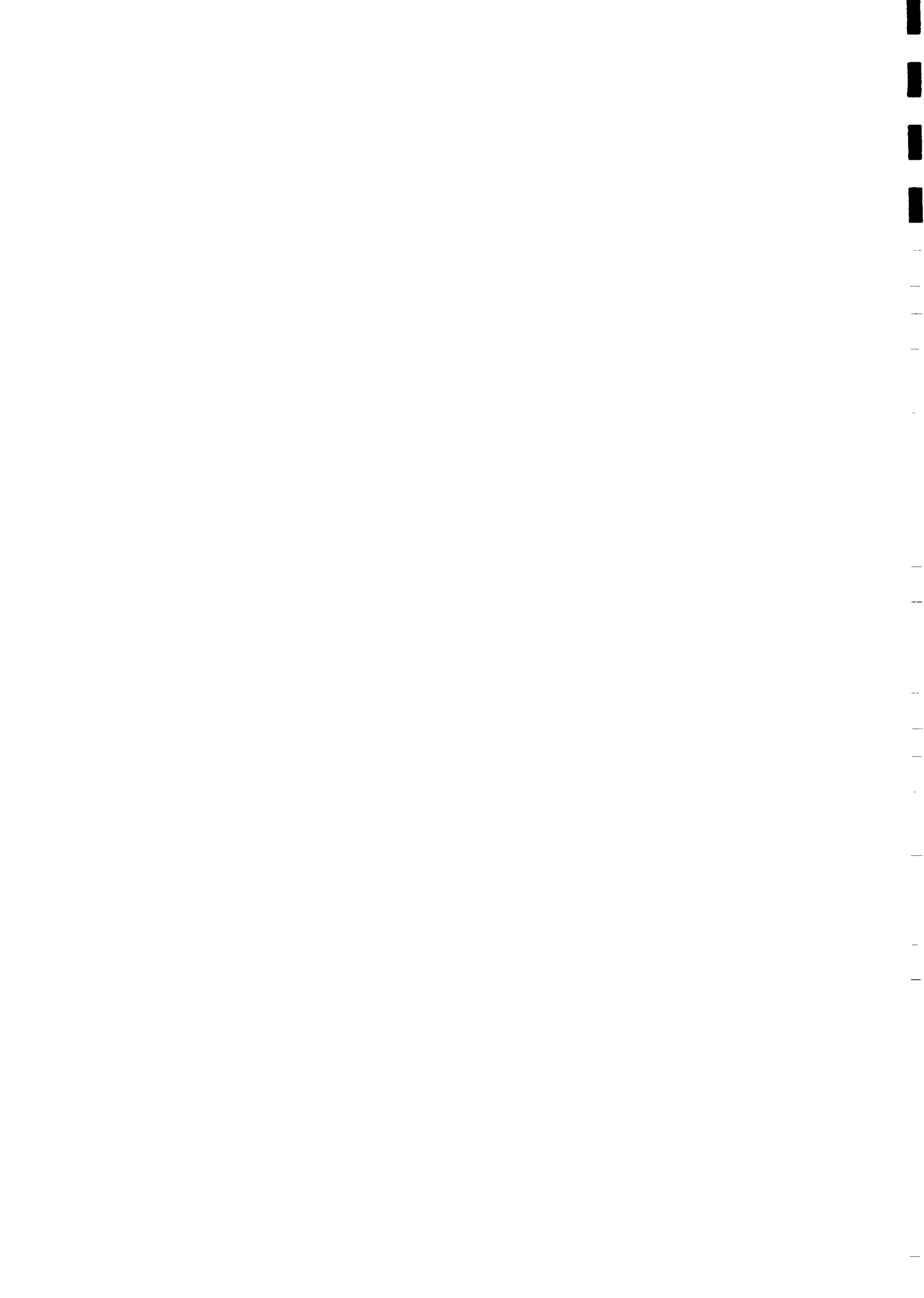


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SUMMARY OF SURVEY RESULTS

A. INCIDENCE OF DIARRHOEA IN THE PROJECT AREA

- (i) Percentage of population attacked by diarrhoea during month immediately preceding the survey :

| | | |
|----|-------------|-------|
| a) | Kapecha 1 - | 13.0% |
| b) | Kapecha 2 - | 11.9% |
| c) | Bamba - | 29.4% |

- (ii) Average monthly cases of diarrhoea treated in local dispensaries between July 1990 and June 1991.

| PROJECT AREA | Average cases treated monthly | Cases treated as % of population |
|--------------|-------------------------------|----------------------------------|
| Kapecha 1 | 147.20 | 0.36 |
| Kapecha 2 | 62.20 | 0.13 |
| Bamba | 76.10 | 0.19 |

B. INCIDENCE OF INTESTINAL WORM INFESTATION IN THE PROJECT AREA

Average monthly cases of intestinal worm infestation treated by local dispensaries :

| | |
|-------------|-------|
| Kapecha 1 - | 208.3 |
| Kapecha 2 - | 156.1 |
| Bamba - | 126.5 |

C. WATER RELATED CHARACTERISTICS OF THE PROJECT AREA

- (i) Percentage of population involved in water fetching activities :

| | |
|-------------|-------|
| Kapecha 1 - | 30.0% |
| Kapecha 2 - | 30.0% |
| Bamba - | 25.5% |



(ii) Average age of water fetcher :

| | | |
|-----------|---|------------|
| Kapecha 1 | - | 24.5 years |
| Kapecha 2 | - | 26.6 years |
| Bamba | - | 23.6 years |

(iii) Distances travelled per day (to & fro) by each water fetcher in order to obtain water during the dry (longest) season :

| PROJECT AREA | Mean distance to and fro (Kms) | Turns (trips) per day | Probable distance travelled (Kms) |
|--------------|--------------------------------|-----------------------|-----------------------------------|
| Kapecha 1 * | 4.2 | 2 | 8.4 |
| Kapecha 2 * | 7.9 | 2 | 15.8 |
| Bamba | 13.5 | 2 | 27.0 |

* The figures give distances travelled by people prior to installation of pipeline by KIWASAP.

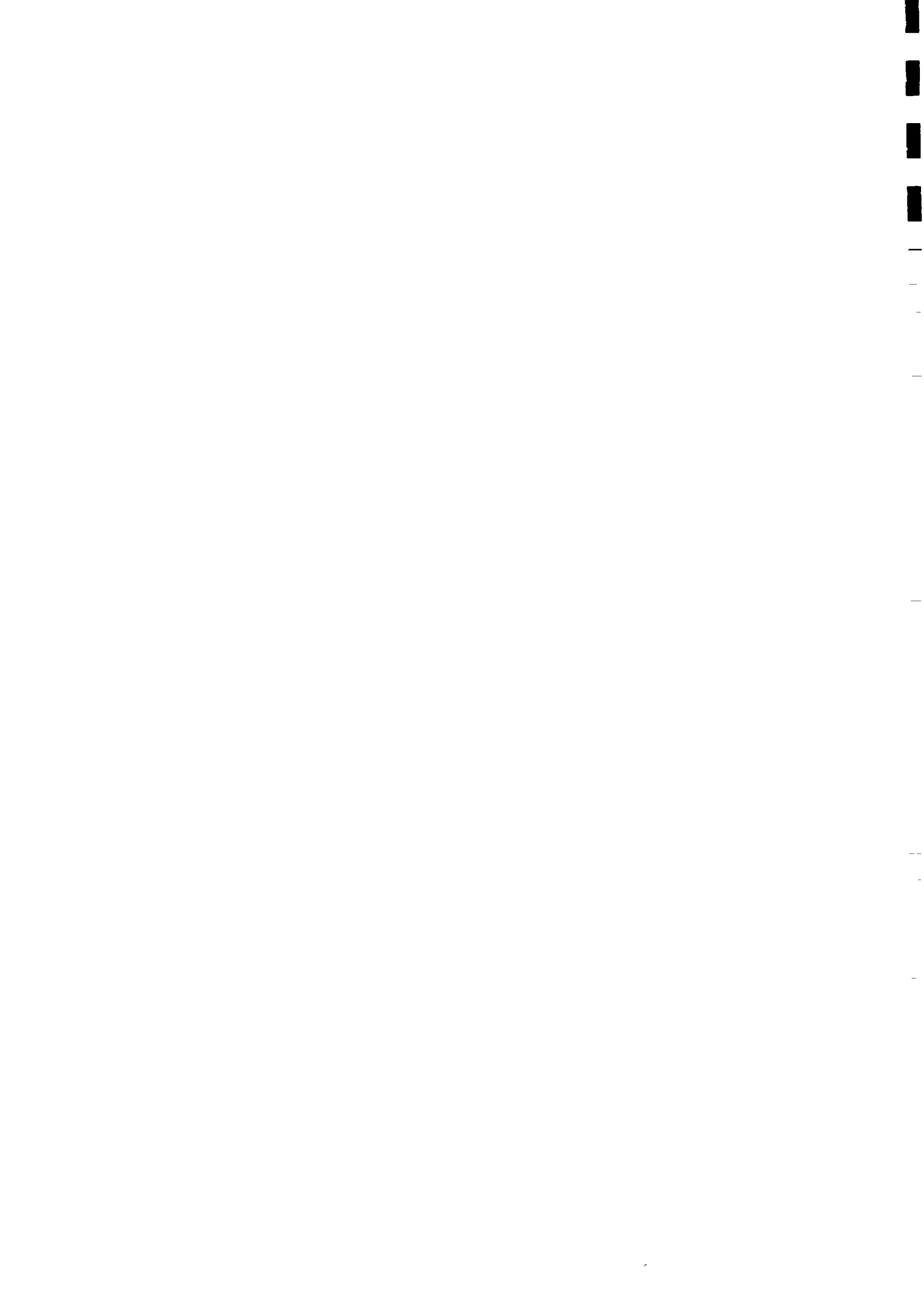
(iv) Types of water sources used by more than 20% of people

| PROJECT AREA | DRY SEASON | | WET SEASON | |
|--------------|--------------|----------|--------------|---------|
| Kapecha 1 | Shallow well | (30.2%) | Puddle | (41.5%) |
| | Stream | (53.5%) | Pan/dam | (41.5%) |
| Kapecha 2 | Shallow well | (28.2%) | Shallow well | (30.6%) |
| | Tap | (30.7%)+ | Puddle | (38.9%) |
| | Stream | (28.2%) | Stream | (27.8%) |
| Bamba | Shallow well | (20.5%) | Puddle | (41.5%) |
| | Pan/dam | (29.5%) | Pan/dam | (41.5%) |
| | Stream | (29.5%) | | |

+ anomaly

(v) Average water Consumption per person per day :

| | | |
|-----------|---|-------------|
| Kapecha 1 | - | 10.1 litres |
| Kapecha 2 | - | 11.1 litres |
| Bamba | - | 9.3 litres |



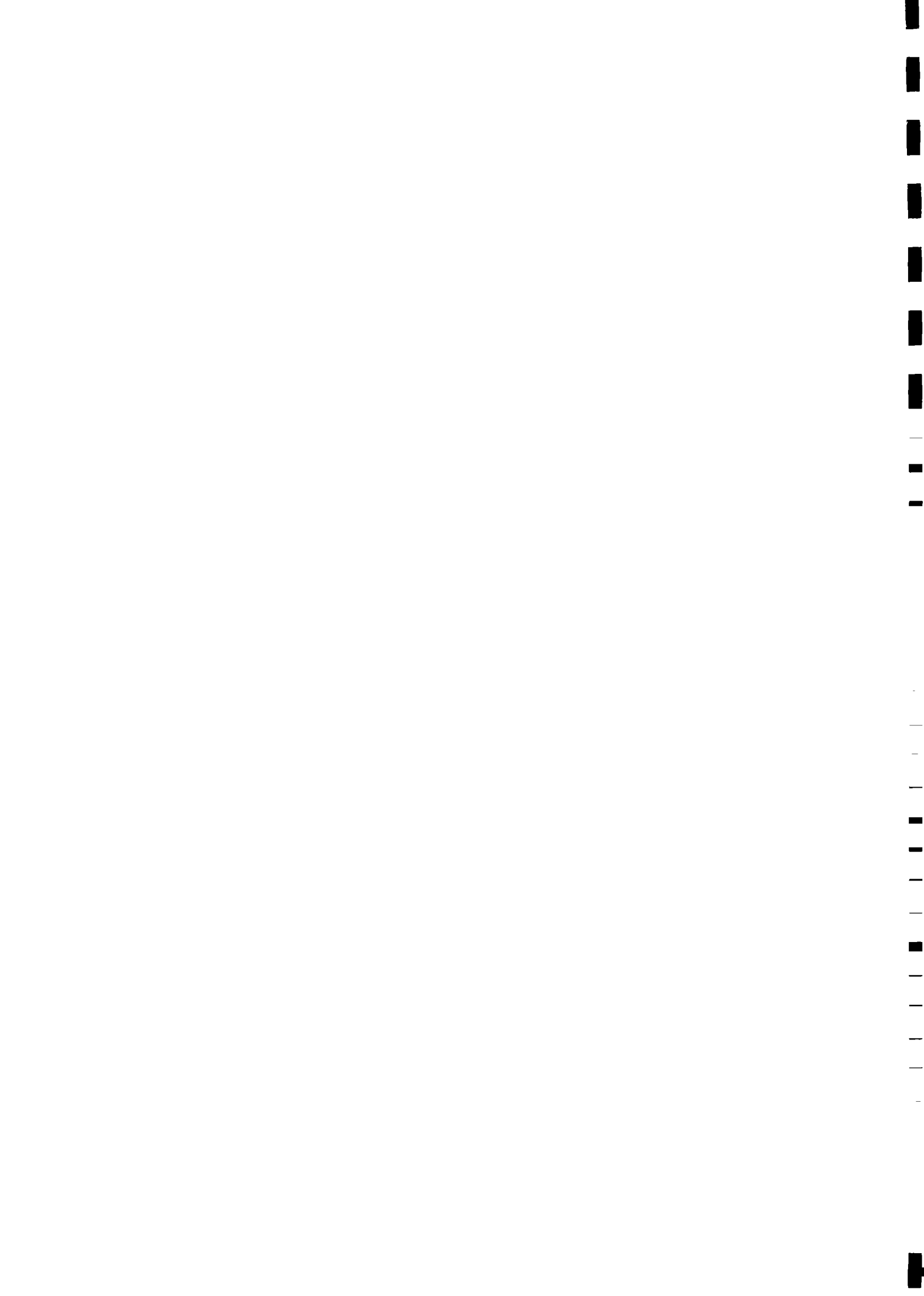
D. PIT LATRINE FACILITIES AVAILABLE IN THE PROJECT AREA

(i) Institutional (School) pit latrine facilities :

| PROJECT AREA | PIT LATRINE | STUDENT PER PIT LATRINE RATIO |
|--------------|-------------|----------------------------------|
| Kapecha 1 | 12 | 70 : 1 |
| Kapecha 2 | 9 | 100 : 1 |
| Bamba | 18 | 142 : 1 |

(ii) Pit latrine facilities in homesteads

| CHARACTERISTIC | KAPECHA 1 | KAPECHA 2 | BAMBA |
|---|-----------|-----------|---------|
| Homesteads with pit latrine in sample | 5 | 4 | 2 |
| Probable percentage of homesteads with pit latrine | 12.8 | 9.3 | 5.3 |
| Ratio of people per pit latrine facility | 93 : 1 | 104 : 1 | 416 : 1 |



1.0 PREAMBLE

1.1 During the ZOPP workshop held in May 1991, the planning team realised that there were quite a number of parameters concerning KIWASAP which had thereto not been quantitatively established by the project team. It was felt that it was urgently necessary to carry out quick sample surveys to establish the following parameters:

- * The rate of diarrhoea in the project area
- * The rate of intestinal worm infestation in the community of the project area.
- * Per capita consumption of water in the project area.
- * Average distances travelled between homesteads and water sources in the project area.
- * Proportion of households or homesteads with pit latrines in the project area.

1.2 In July, 1991, Crossland Management, Consultants designed and carried out the required sample survey. Determination of the above parameters was part of the terms of reference for the task. The other terms of reference concerned assessment of community training needs in fields of hygiene, water and sanitation.



1.3 This report concentrates on determination of parameters outlined in 1.1 above. Other aspects of the terms of reference are reported on separately.

2.0 SURVEY METHODOLOGY

Team Composition

2.1 The exercise was undertaken as a joint exercise involving both KIWASAP and Crossland Management Consultants. The consultancy provided the following staff and expertise:

- o 1 development and training consultant
- o 1 field supervisor
- o 4 interviewers/field staff

2.2 KIWASAP provided following staff and facilities:

- o 1, 4-wheel drive motor vehicle with a driver
- o 4 motor cycles with riders.

Sample Size.

2.3 As of the time of the survey, the project area had been subdivided in three zones, namely:

- Kapecha 1
- Kapecha 2
- Bamba (hinterland)



2.4 During sample size determination, the above zones, had to be broken down into respective constituent administrative locations. It was agreed that the sampling unit should be the household. Given the terrain, weather conditions, available personnel, distances between homesteads and the number and nature of questions which had to be asked, it was anticipated that an average interviewer would be able to interview only 3 households per day. Thus in order to complete the exercise in 10 days, it was decided to interview a total of 120 households.

2.5 The estimated number of households per location to be visited by interviewers was obtained from the Central Bureau of Statistics. Unfortunately the most current data available pertained to the 1979 population census. Those were the figures used to compute the sample size of households to be interviewed in each of the locations in the project area. Minor biases were applied as shown in Table 1 below:

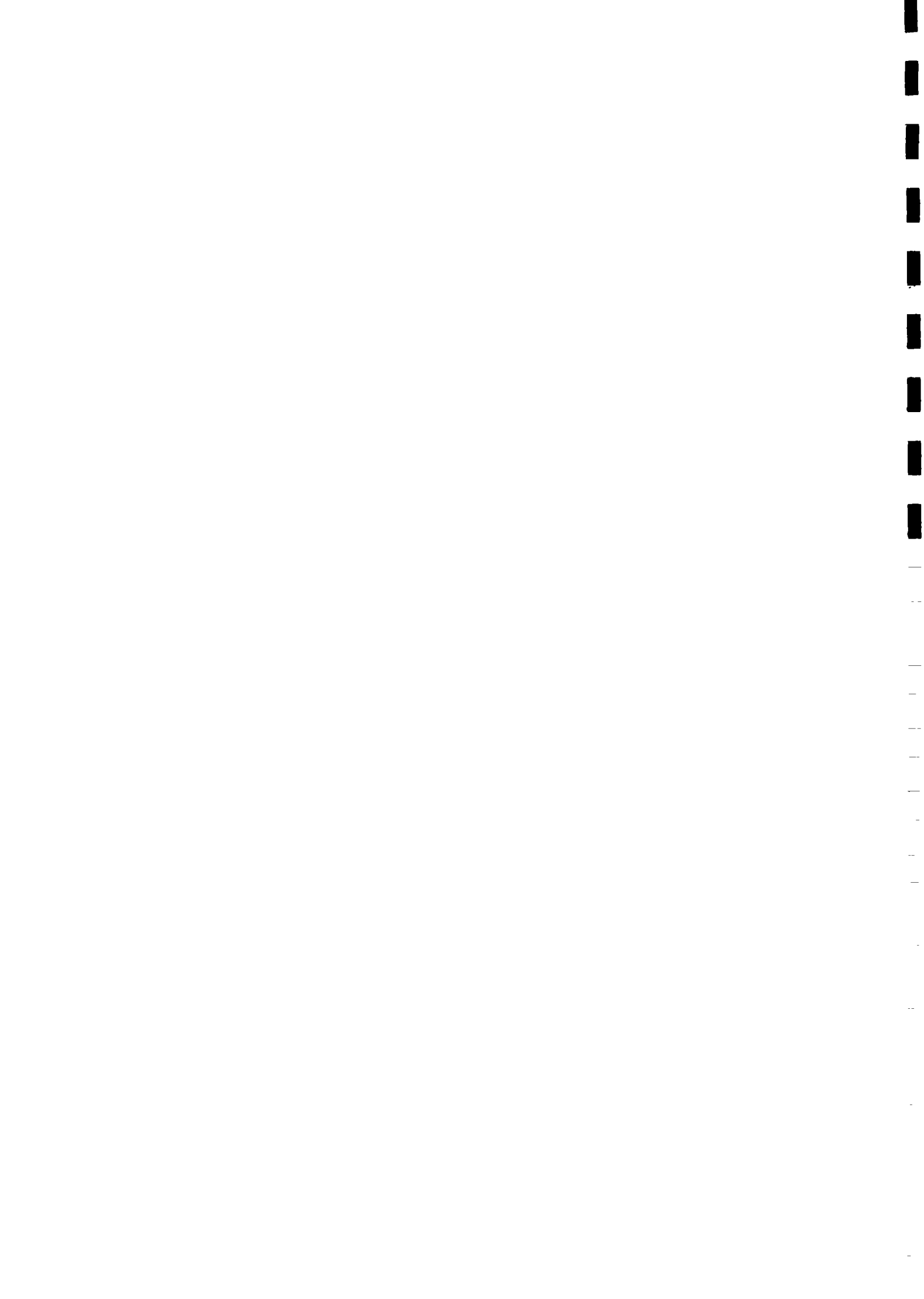


TABLE 1
SAMPLE SIZE ALLOCATIONS

| PROJECT AREA | ADMIN LOCATION | POPULATION (1979) | HOUSEHOLDS (1979) | SAMPLE SIZE |
|--------------|--------------------------|-------------------|-------------------|-------------|
| Kapecha 1 | Takaungu | 13,805 | 2,947 | 20* |
| | Junju | 12,753 | 2,896 | 19* |
| Kapecha 2 | Chonyi (North) | 15,316 | 2,111 | 20+ |
| | Chonyi South (Mwarakaya) | 15,467 | 2,542 | 32+ |
| Bamba | Bamba | 22,346 | 4,256 | 32 |
| | Ndigiria | 3,751 | 734 | 6 |
| TOTAL | | 83,438 | 15,486 | 120 |

Source: Central Bureau of Statistics

NOTES

(a) * Sample sizes for Takaungu ;and Junju locations were given a relatively low bias because the project operations are a bit far from the main population centres along the coast.

(b) + Sample sizes for Chonyi North and ;Mwarakaya were given a relatively high bias because the project operations are within the main human population centres.

Questionnaire and form design

2.6 A form was designed to enable collection of data from the Ministry of Health with regard to:



- (i) rate of diarrhoea attacks treated by dispensaries in the project area.
- (ii) rate of intestinal worm infestation treated by dispensaries in the project area.

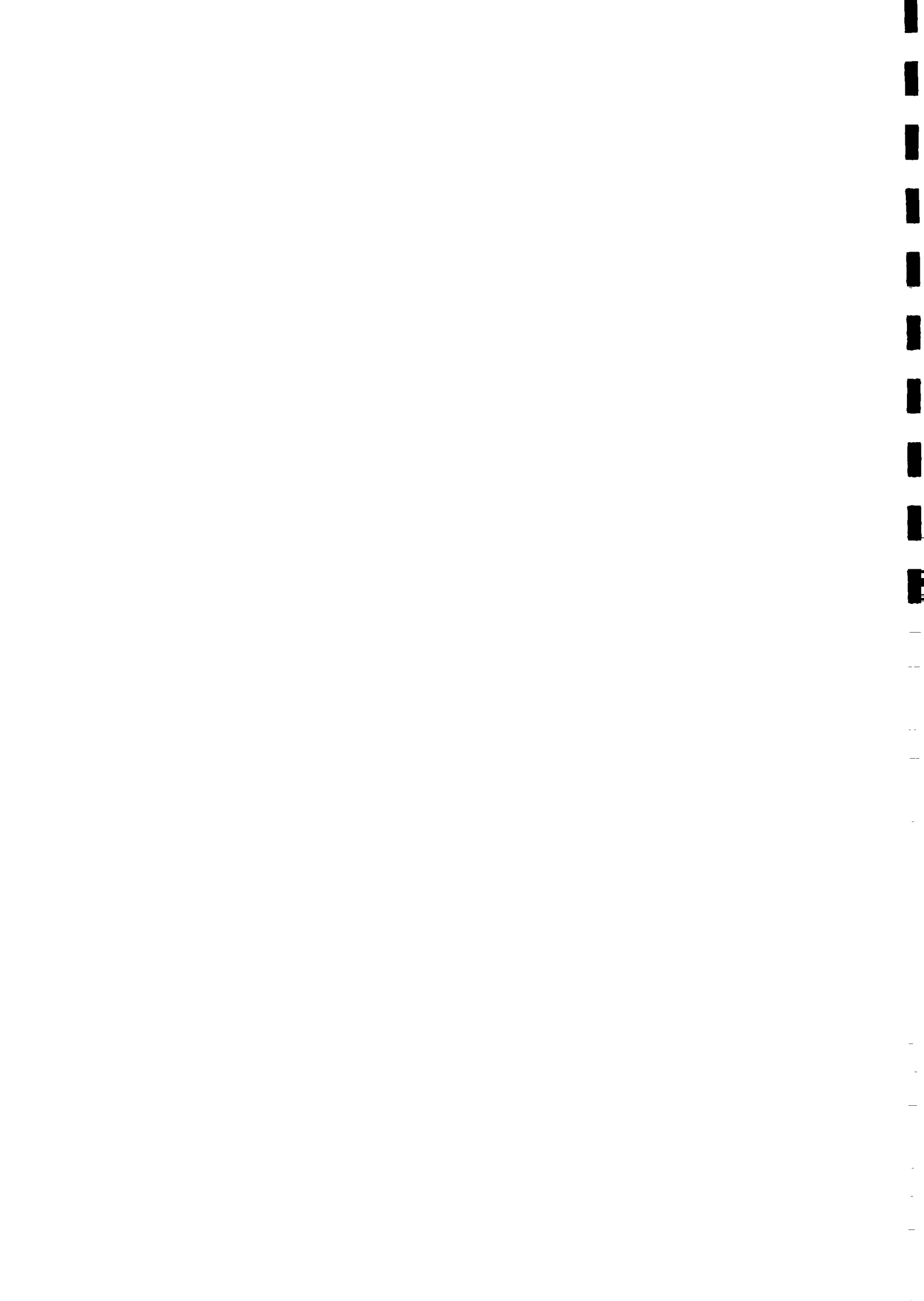
In addition to the above rates it was thought desirable to collect data on rates of treatment of attacks of:

- (i) Malaria
- (ii) Bilharzia
- (v) Eye infection

2.7 At the next stage a questionnaire involving 43 questions was designed. 9 of the questions were included for purposes of collecting the required parameters or performance indicators directly from the community.

Selection and training of interviewers

2.8 Five interviewers were selected, all of whom had a good command of the local languages and customs. In addition they had been involved in other field data collection exercises. Those selected were given one day classroom training on the questionnaire and one day field training. The field training was carried out in Kapecha 1 and Kapecha 2 zones of the project. Apart from giving the trainee interviewers practical



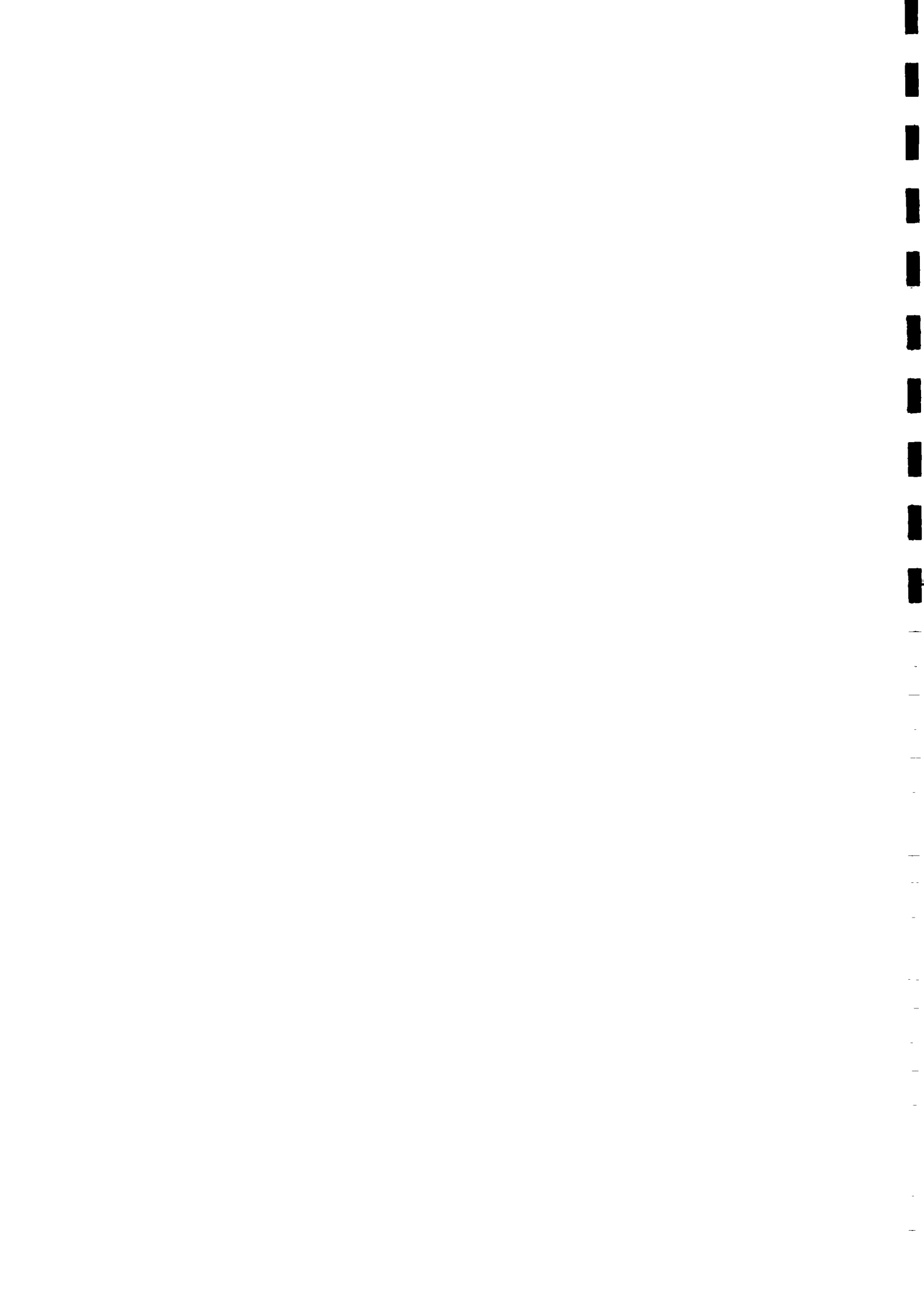
experience in asking questions and recording data, the exercise was also taken as an opportunity to test the questionnaire itself. Four of the interviewers were confirmed while one was dropped.

Testing of the questionnaire

- 2.9 This activity, has been outlined in 2.8 above. After the field training of interviewers and testing of the questionnaire, it was appropriately revised.

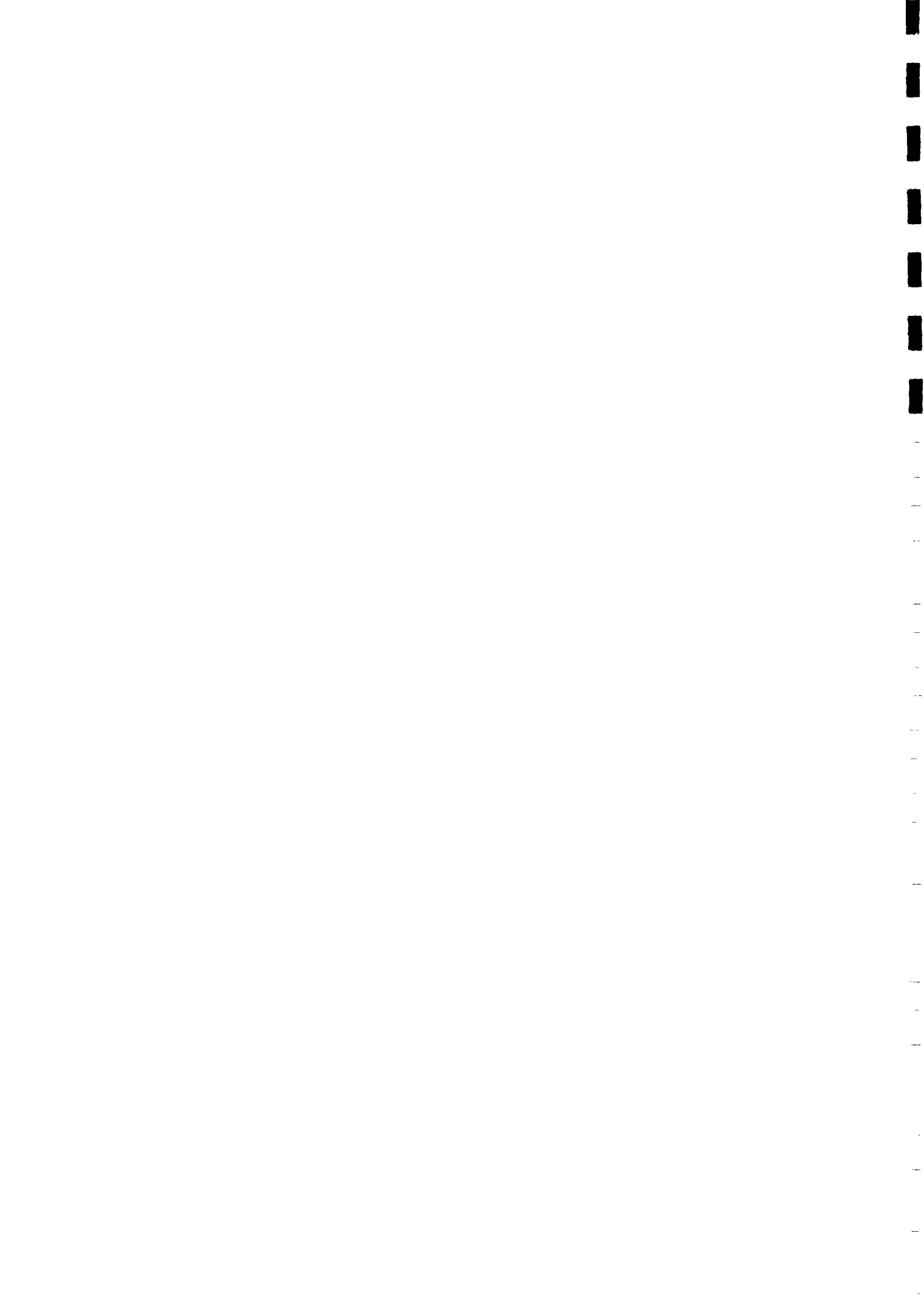
Data Collection

- 2.10 Data regarding selected communicable diseases in Bamba Hinterland was obtained from Bamba dispensary records. In order to facilitate computation of representative averages, data was collected for the period July 1990 to June 1991.
- 2.11 With regard to Kapecha 1 and Kapecha 2 zones of operation of the project, it was not possible to collect desired data from the local dispensaries. The officers in-charge of the dispensaries claimed that they passed on data monthly to the district head office at Kilifi. However, on reaching Kilifi, the district Public Health Office revealed that not all the data had been availed for all the months. It was learnt that with effect from December 1990, data for



Mwarakaya location was being sent to Mariakani division headquarters. It was then too late to follow up. However sufficient data was collected to arrive at reasonably reliable results.

2.12 Primary data was collected from responding households by means of the designed questionnaire. The interviewers worked in teams of two; each of which comprised of 1 interviewer and 1 motor cycle rider. Each team was allocated a certain Location or general direction within an operational zone of the project. There were no sampling frames (ie lists of households from which to draw samples for interviews). For that reason, the field supervisor selected a random start for each team and advised the team to interview one household located in a homestead after every ten homesteads in any given direction. Although the sampling interval of 10 homesteads was chosen rather arbitrarily, it was estimated to be sufficient for purposes of adequately covering the zones in question as well as obtaining varied information especially with respect to distances travelled when fetching water. It had earlier on been established that the zones did not exhibit characteristics of linear or regular periodicity. Another instruction given to interviewers was that for every 3 respondents selected, 2 should be females. This was done mainly because the salient parameters being determined, e.g.



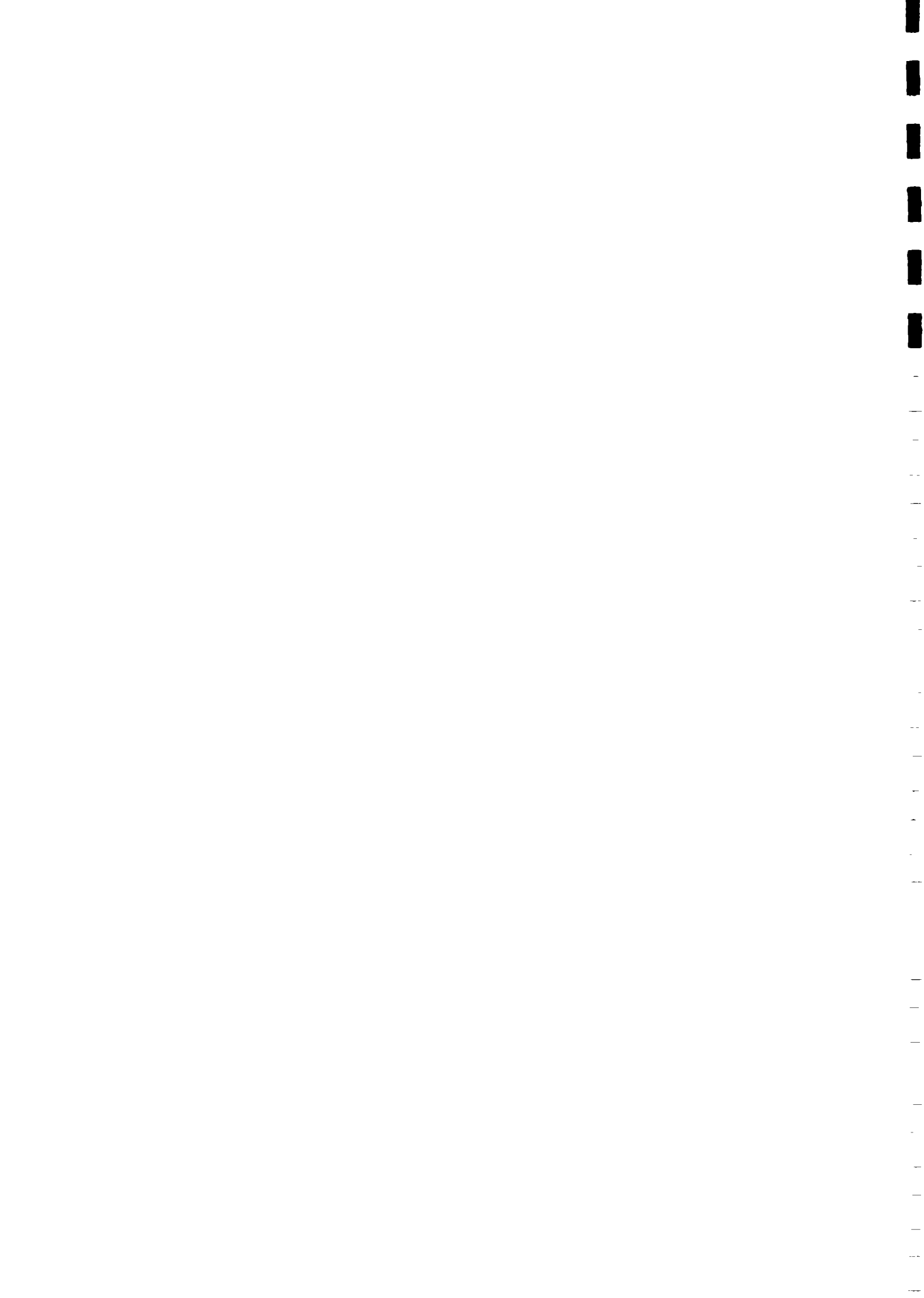
distances travelled to and from water sources, mostly concerned women. Thus, it was felt that women would tend to give more accurate information.

2.13 The people in the project area live in homesteads, each of which comprise of a number of households. It was arranged that immediately after greetings and introductions, the interviewer would continue to ask questions and to record the replies of the respondent. Meanwhile the motor cycle rider would request any other member of the homestead available to take him to the sources of water used by the water fetchers from the homestead during the dry season and during the wet season respectively. Care was taken to use footpaths which the water fetchers normally use and not the main roads. The distances were accurately recorded.

2.14 The field supervisor attended interviews at random to ensure efficiency and effectiveness of operations. Furthermore he ensured proper recording of data and exhaustion of sample size per zone.

Data processing

2.15 After the field operations the raw data was collated by a team of statistical clerks. Then it was processed and analysed by computer. The results are contained in the following sections of the report.



3.0 SURVEY RESULTS

3.1 Table 2 below shows the population distribution of the project area

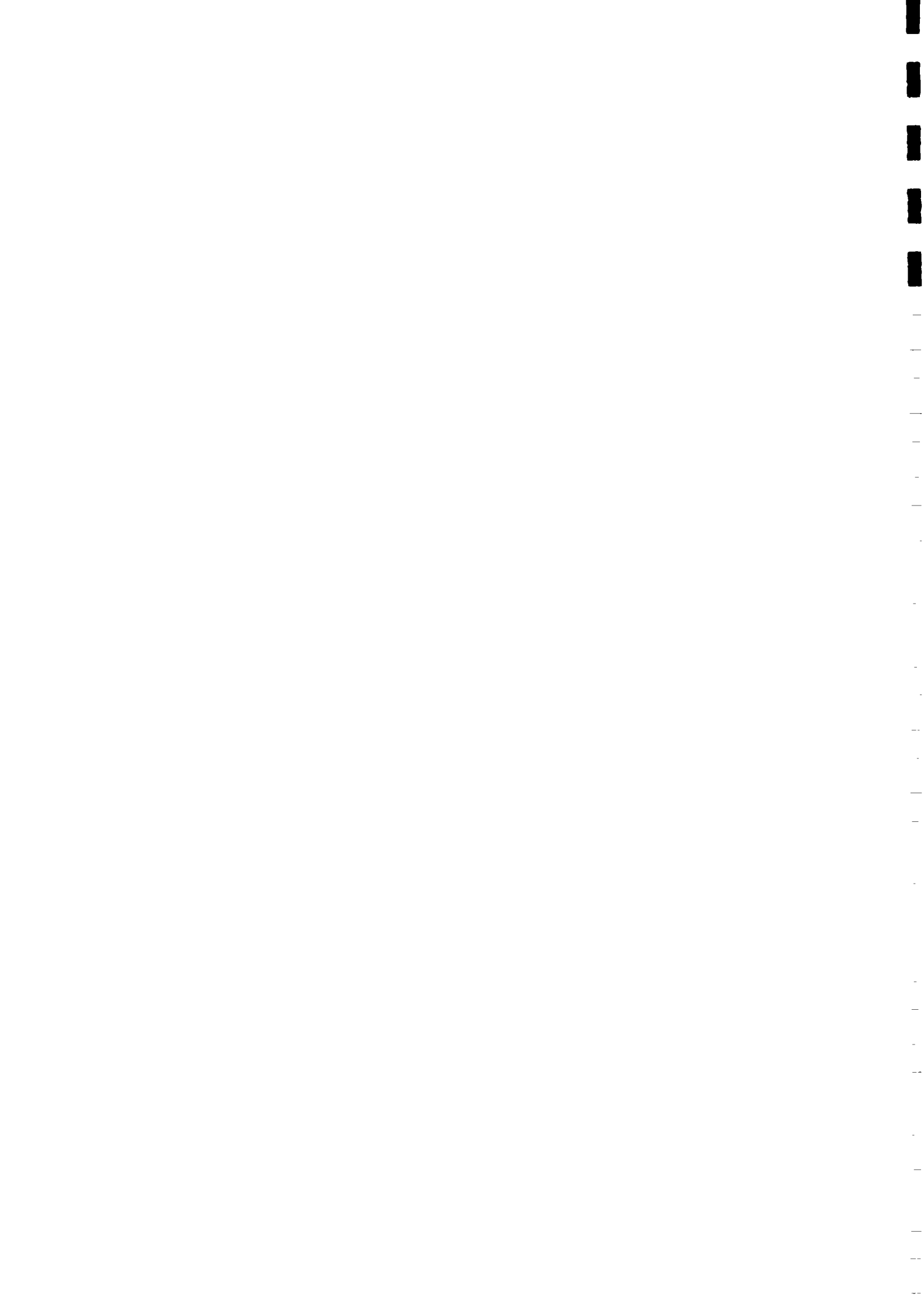
TABLE 2
POPULATION DISTRIBUTION OF THE PROJECT AREA

| PROJECT AREA | ADMIN LOCATION | POPULATION (1979) | POPULATION (1990 PROJECTION) |
|--------------|----------------|-------------------|------------------------------|
| Kapecha 1 | Takaungu | 13,805 | 21,210 |
| | Junju | 12,753 | 19,220 |
| Kapecha 2 | Chonyi (North) | 15,316 | 23,380 |
| | Chonyi South | 15,467 | 23,610 |
| | (Mwarakaya) | | |
| Bamba | Bamba | 22,346 | 34,110 |
| | Ndigiria | 3,751 | 5,730 |
| TOTAL | | 83,438 | 127,260 |

Sources : Central bureau of statistics

Rates of infection by selected communicable diseases.

3.2 Tables 3 to 7 below show survey results with regard to rates of infection of the Community by selected communicable diseases, as well as rates of treatment of such diseases by local dispensaries in the project area.



Diarrhoea

TABLE 3A

INCIDENCE OF DIARRHOEA AMONG MEMBERS OF RESPONDING HOUSEHOLDS
DURING MONTH IMMEDIATELY PRECEDING SURVEY

| AGE GROUP | P R O J E C T A R E A | | | | | | | | |
|--------------|---------------------------|-------------------------------|---------------|---------------------------|-------------------------------|---------------|---------------------------|-------------------------------|---------------|
| | KAPECHA 1 | | | KAPECHA 2 | | | BAMBA | | |
| | NOS IN AGE GROUP | NOS WITH DIARR -HOEA | % OF GROUP | NOS IN AGE GROUP | NOS WITH DIARR -HOEA | % OF GROUP | NOS IN AGE GROUP | NOS WITH DIARR -HOEA | % OF GROUP |
| 0-5 yrs | 51 | 10 | 19.6 | 50 | 11 | 22.0 | 65 | 20 | 30.8 |
| 6-15 yrs | 41 | 0 | 0.0 | 44 | 1 | 0.0 | 42 | 8 | 19.0 |
| 16-25 yrs | 30 | 4 | 13.3 | 15 | 1 | 0.1 | 20 | 9 | 45.0 |
| 26-35 yrs | 20 | 4 | 20.0 | 18 | 0 | 0.0 | 23 | 1 | 0.0 |
| 36-45 yrs | 19 | 4 | 21.0 | 15 | 0 | 0.0 | 12 | 9 | 75.0 |
| 46-55 yrs | 14 | 2 | 14.3 | 15 | 3 | 20.0 | 18 | 5 | 27.8 |
| above 55 yrs | 9 | 0 | 0.0 | 11 | 4 | 36.4 | 7 | 3 | 42.9 |
| TOTAL | 184 | 24 | 13.0 | 168 | 20 | 11.9 | 187 | 55 | 29.4 |

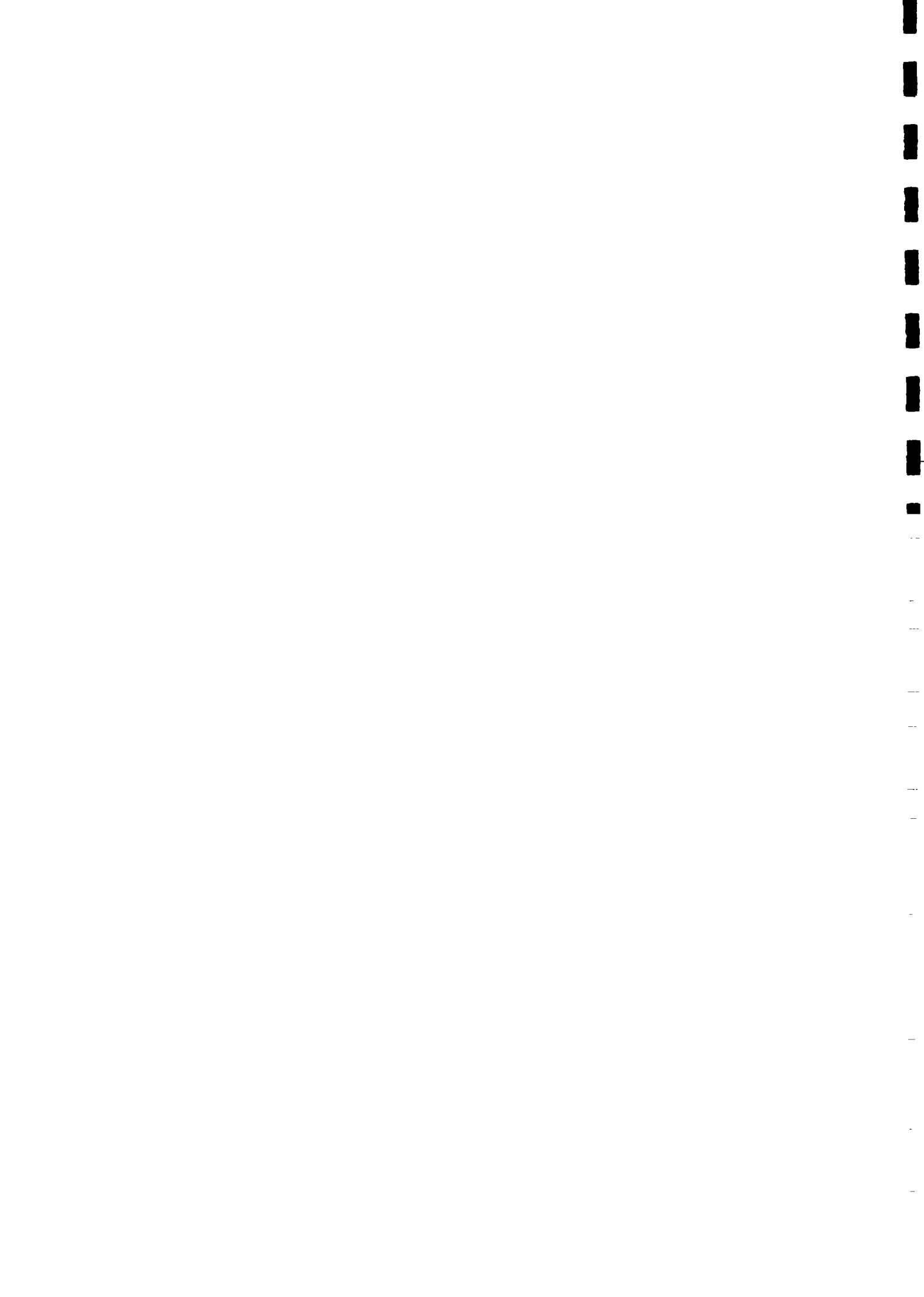
Source : sample survey

TABLE 3B

CASES OF DIARRHOEA TREATED BY DISPENSARIES IN THE PROJECT AREA
(JULY 1990 - JUNE 1991)

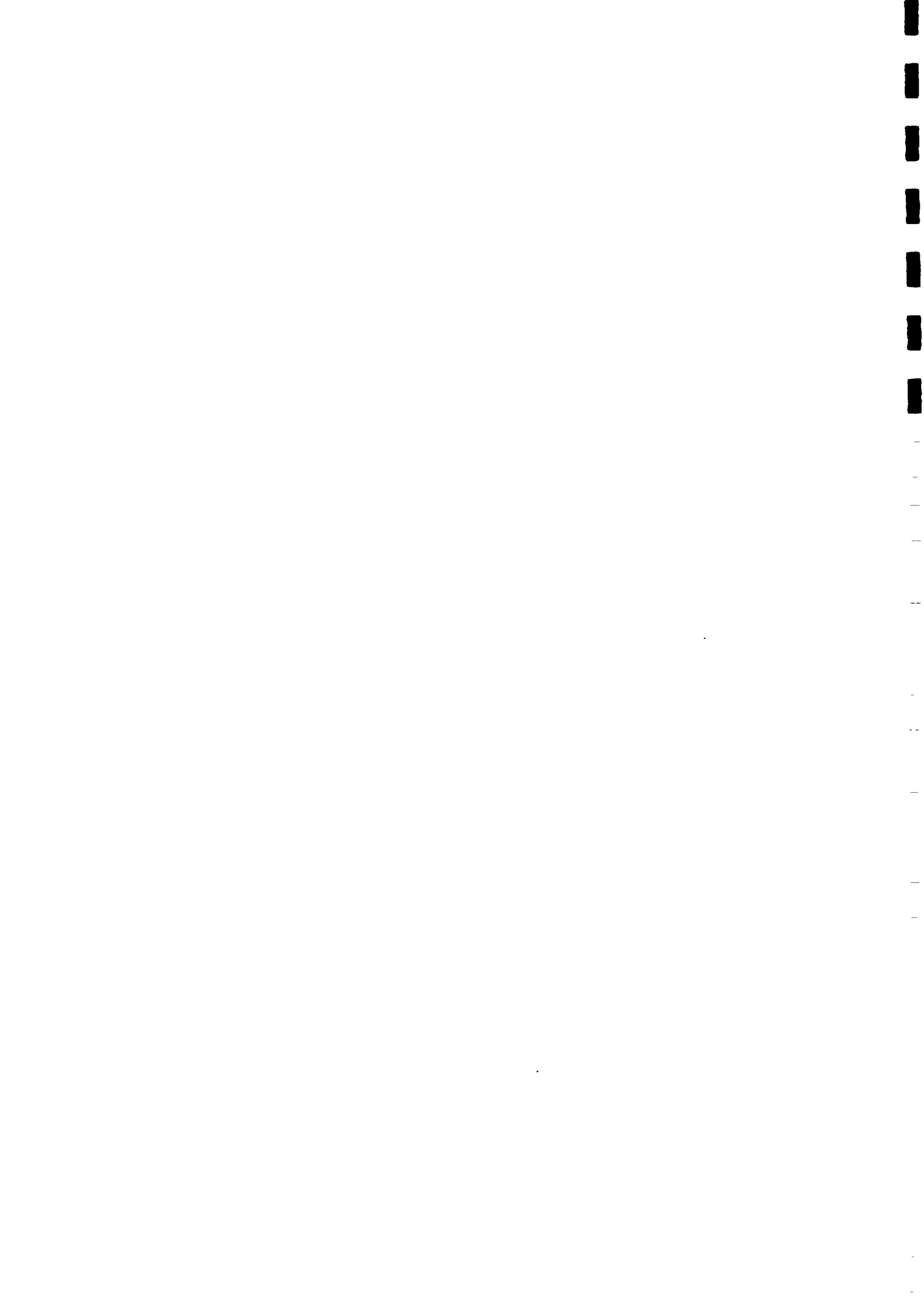
| | P R O J E C T A R E A | | |
|--|-----------------------|-----------|--------|
| | KAPECHA 1 | KAPECHA 2 | BAMBA |
| Average monthly cases of diarrhoea treated at dispensaries | 147.20 | 62.20 | 76.10 |
| Population (1990 projection by CBS) | 40,430 | 46,990 | 39,840 |
| % of Population at risk treated | 0.36 | 0.13 | 0.19 |

Sources : (i) Kilifi district public health office.
(ii) Bamba dispensary.



3.3 Table 3A shows that during the month preceding the survey, 13.0% of members of households responding to interview in Kapecha 1 had an attack of diarrhoea. About 20.0% of those who suffered from the disease in the area during the month were aged 5.0 years or less. Similarly in Kapecha 2, about 12.0% of members of households which responded to interview suffered from diarrhoea, approximately 22.0% of casualties having been children aged 5 years or under. The corresponding figures for Bamba are about 29.0% and 31.0% respectively.

3.4 Table 3B paints the picture that local dispensaries are relatively insignificant for purposes of treating diarrhoea i.e. most people who suffer from the disease do not attend clinics at the local dispensaries. The survey revealed that other modes of treatment of diarrhoea included: local herbs administered at home or by a nearby local healer as well as some drugs bought from local shops.



Eye Infections

TABLE 4A

INCIDENCE OF EYE INFECTIONS AMONG MEMBERS OF HOUSEHOLDS OF
RESPONDENTS DURING THE MONTH PRECEEDING THE SURVEY

| AGE GROUP | P R O J E C T A R E A | | | | | | | | |
|--------------|----------------------------|--------------------------|---------------|---------------------------|------------------|---------------|---------------------------|------------------|---------------|
| | KAPECHA 1 | | | KAPECHA 2 | | | BAMBA | | |
| | NOS. IN AGE GROUP | NOS WITH INFECTION | % OF GROUP | NOS IN AGE GROUP | NOS INFECTION | % OF GROUP | NOS IN AGE GROUP | NOS INFECTION | % OF GROUP |
| 0-5 yrs | 51 | 10 | 19.6 | 50 | 3 | 6.0 | 65 | 2 | 3.1 |
| 6-15 yrs | 41 | 2 | 4.9 | 44 | 1 | 2.3 | 42 | 2 | 4.8 |
| 16-25 yrs | 30 | 2 | 6.7 | 15 | 0 | 0.0 | 20 | 0 | 0.0 |
| 26-35 yrs | 20 | 1 | 5.0 | 18 | 0 | 0.0 | 23 | 1 | 4.3 |
| 36-45 yrs | 19 | 1 | 5.3 | 15 | 0 | 0.0 | 12 | 0 | 0.0 |
| 46-55 yrs | 14 | 1 | 7.1 | 15 | 0 | 0.0 | 18 | 2 | 11.1 |
| above 55 yrs | 9 | 0 | 0.0 | 11 | 1 | 9.1 | 7 | 3 | 43.0 |
| Totals | 184 | 17 | 9.2 | 168 | 5 | 3.0 | 187 | 10 | 5.3 |

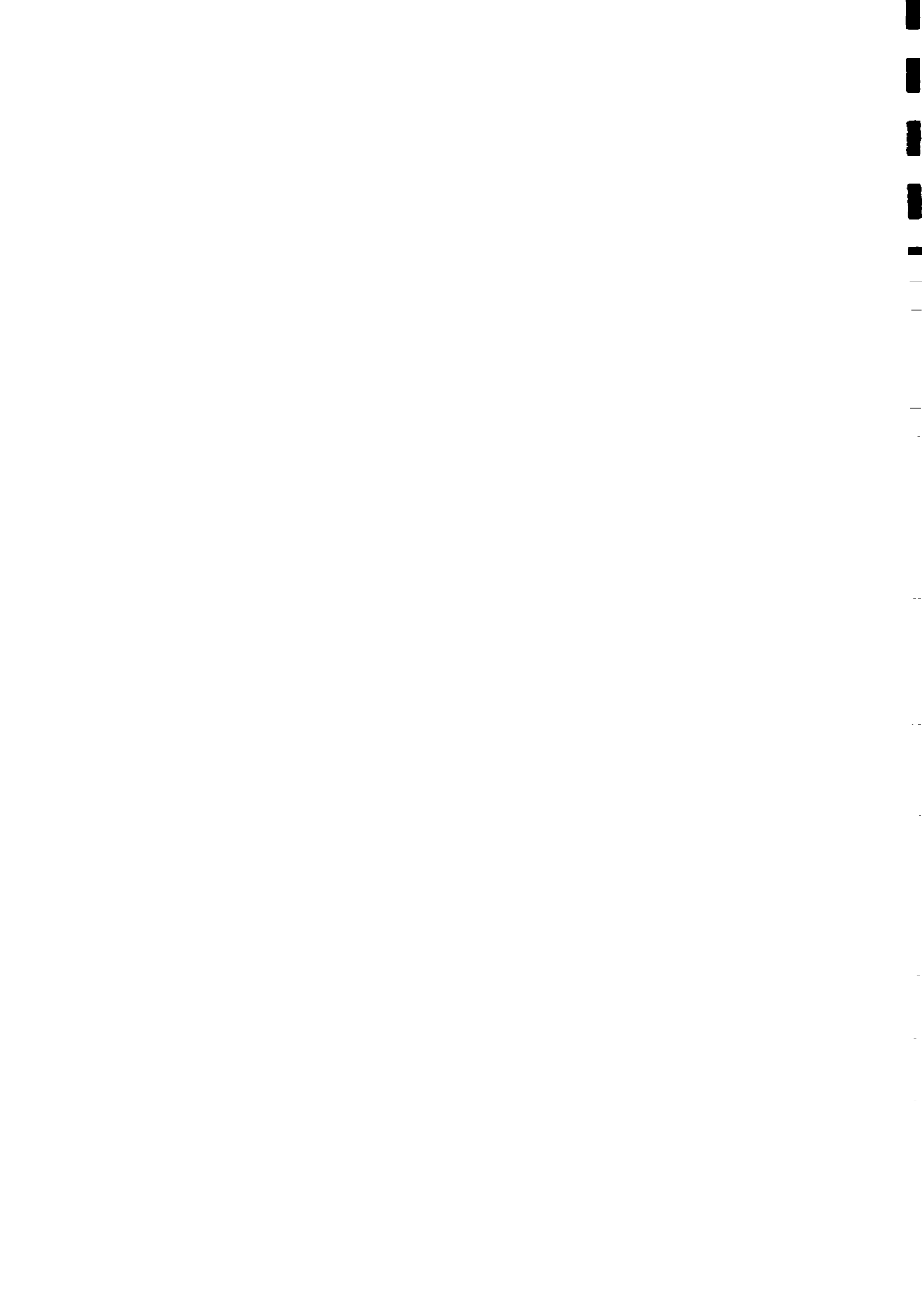
Source : sample survey

TABLE 4B

CASES OF EYE INFECTION TREATED BY LOCAL DISPENSARIES IN THE
PROJECT AREA (JULY 1990 - JUNE 1991)

| | P R O J E C T A R E A | | |
|--|-----------------------|-----------|--------|
| | KAPECHA 1 | KAPECHA 2 | BAMBA |
| Average monthly cases of eye infection treated at dispensaries | 76.4 | 57.3 | 29.0 |
| Population (CBS Projections for 1990) | 40,430 | 46,990 | 39,840 |
| % of Population at risk treated | 0.19 | 0.12 | 0.07 |

Sources : (i) Kilifi district public health office.
(ii) Bamba dispensary.



- 3.5 The rates of eye infection in the month immediately preceding the survey among members of households which responded to interviews during the survey is depicted in table 4A above. The survey indicated that 9.2% of people Kapecha 1 suffered from eye infection during the month in question. The corresponding figures for Kapecha 2 and Bamba are 3.0% and 5.3% respectively.
- 3.6 Table 4B shows that on average during the 12 months ending June 1991, the cases of eye infections referred to local dispensaries every month were negligible. The respective rates for Kapecha 1, Kapecha 2 and Bamba were 0.19% of population, 0.12 of population and 0.07 of population at risk.
- 3.7 No attempt was made to bring to light the rates at which the population in the project area is attacked by any of the above disease through questioning respondents. It would have been impractical to do so. Thus the survey team relied on records from the Kilifi District Public Health Office as well as from Bamba dispensary. The data appears in the tables below:



Intestinal worm infestation

TABLE 5

CASES OF INTESTINAL WORMS TREATED BY DISPENSARIES IN THE
PROJECT AREA (JULY 1990 - JUNE 1991)

| PROJECT AREA | MONTH | | | | | | | | | | | | TOTAL | NO OF MONTHS | MONTH AVE |
|-----------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|--------------------|--------------|
| | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | | | |
| KAPECHA 1 | N/A | 202 | 69 | 338 | N/A | 177 | 177 | 196 | 327 | 241 | 254 | 202 | 2083 | 10 | 208.3 |
| KAPECHA 2 | 99 | 160 | N/A | 225 | 163 | 143 | 214 | 159 | 86 | N/A | N/A | N/A | 1249 | 8 | 156.1 |
| BAMBA | 17 | 24 | 62 | 58 | 50 | 78 | 131 | 725 | 148 | 141 | 54 | 30 | 1518 | 12 | 126.5 |

Sources : (i) Kilifi district public health office.
(ii) Bamba dispensary.

3.8 Table 5 shows that in an average month in Kapecha 1, the dispensaries received 208.0 cases of intestinal worms, while in Kapecha 2 and Bamba 156.0 and 127.0 of such cases were received respectively. For each zone, the cases of intestinal worm diseases were more or less equal to those of diarrhoea and eye infections combined. Given the extremely low rates of attendance of clinics demonstrated in tables 3B and 4B above, it should be quite clear that intestinal infestation is very much common in the area. The observation that the cases of the disease treated in Bamba is lower than that of Kapecha 1 and Kapecha 2 may be due to a more pronounced reluctance to attend western type of clinics in Bamba rather than there having been less infestation by intestinal worms.



Malaria

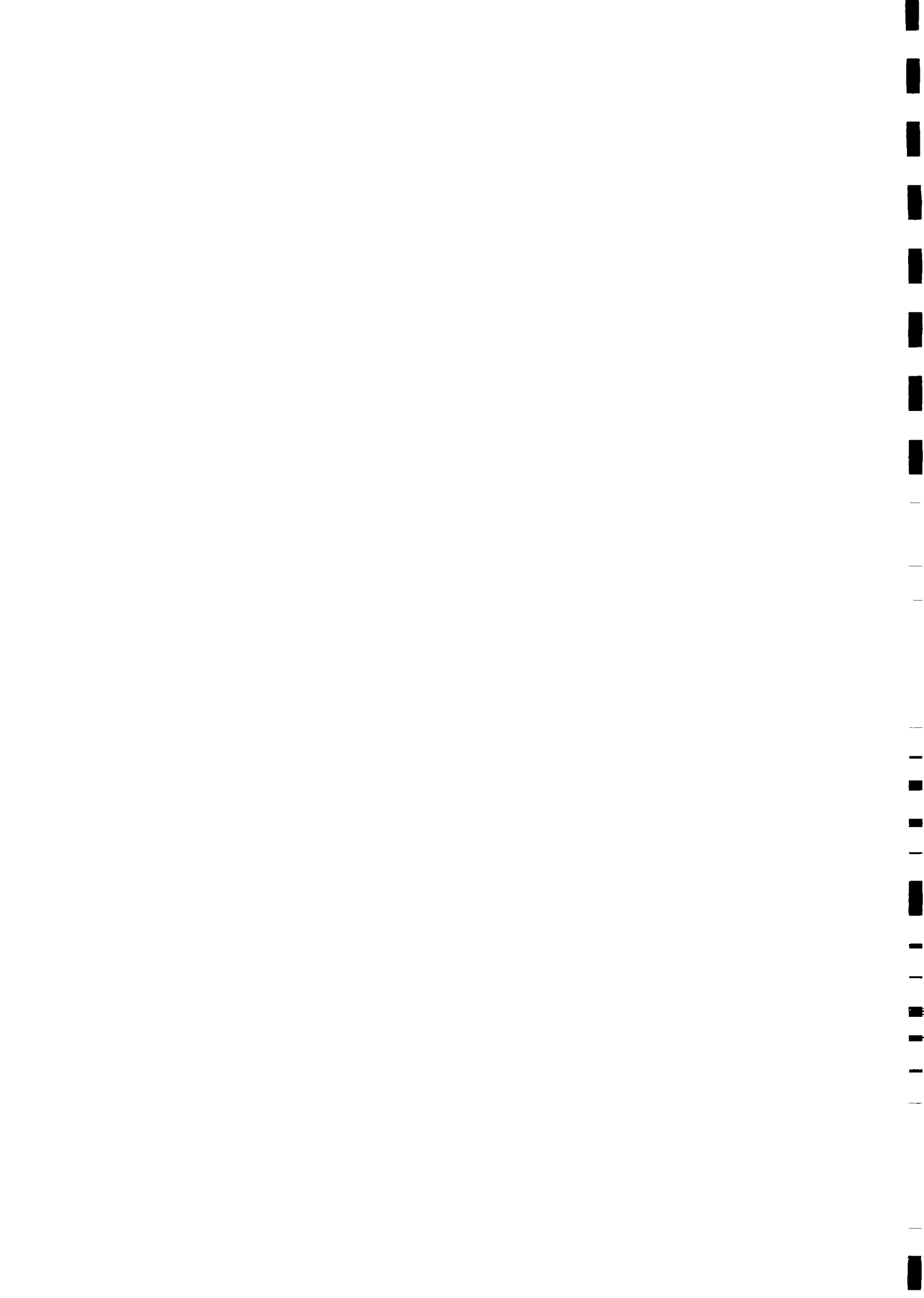
TABLE 6

CASES OF MALARIA TREATED BY LOCAL DISPENSARIES
IN THE PROJECT AREA
(JULY 1990 - JUNE 1991)

| PROJECT AREA | MONTH | | | | | | | | | | | | TOT. | NO OF MTH | MONTH AVE |
|--------------|-------|-----|-----|------|-----|-----|------|-----|-----|-----|------|------|------|-----------|-----------|
| | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | | | |
| KAPECHA 1 | N/A | 824 | 499 | 1309 | N/A | 932 | 1290 | 942 | 827 | 857 | 1007 | 1329 | 9816 | 10 | 981.6 |
| KAPECHA 2 | 512 | 508 | N/A | 333 | 367 | 313 | 318 | N/A | N/A | N/A | N/A | N/A | 2351 | 6 | 391.8 |
| BAMBA | 177 | 145 | 268 | 488 | 518 | 780 | 858 | 756 | 688 | 575 | 429 | 419 | 6101 | 12 | 508.4 |

Sources : (i) Kilifi district public health office.
(ii) Bamba dispensary.

3.9 In an average month between July 1990 and June 1991. Dispensaries in Kapecha 1 treated 981.06 cases of malaria while those in Kapecha 2 and Bamba treated 391.8 and 508.4 cases respectively. The figures and other comparisons indicate that malaria was the disease most commonly referred to local dispensaries by the residents. But the actual cases were of course bound to be much higher than that. For instance, there was a disease known as "Nyuni" which was said to attack young children whose symptoms were known to be those of malaria among infants by western doctors. In the project area, almost all cases of "Nyuni" were referred to local healers for treatment.



Bilharzia

TABLE 7

CASES OF BILHARZIA TREATED BY LOCAL DISPENSARIES
IN THE PROJECT AREA
(JULY 1990 - JUNE 1991)

| PROJECT AREA | TOTAL CASES | NO. OF MONTHS | MONTHLY AVERAGE |
|-----------------------------|-------------|---------------|-----------------|
| Kapecha 1 (Junju location) | 256+ | 10+ | 26+ |
| Kapecha 2 (Chonyi location) | 552* | 8* | 69* |
| Bamba | 599 | 12 | 50.0 |

+ data available was only for Junju location

* data available was only for Chonyi location

Sources : (i) Kilifi district public health office.

(ii) Bamba dispensary.

3.10 With respect to Bilharzia, complete information was available only in the case of Bamba, whose dispensary treated an average of 50 cases of bilharzia during the period investigated.

4.0 WATER FETCHING CHARACTERISTICS OF THE PROJECT AREA

Age Distribution and numbers of Water Fetchers in homesteads

4.1 Table 8A below analyses the age distribution of people who are involved in fetching water in homesteads in the project area.

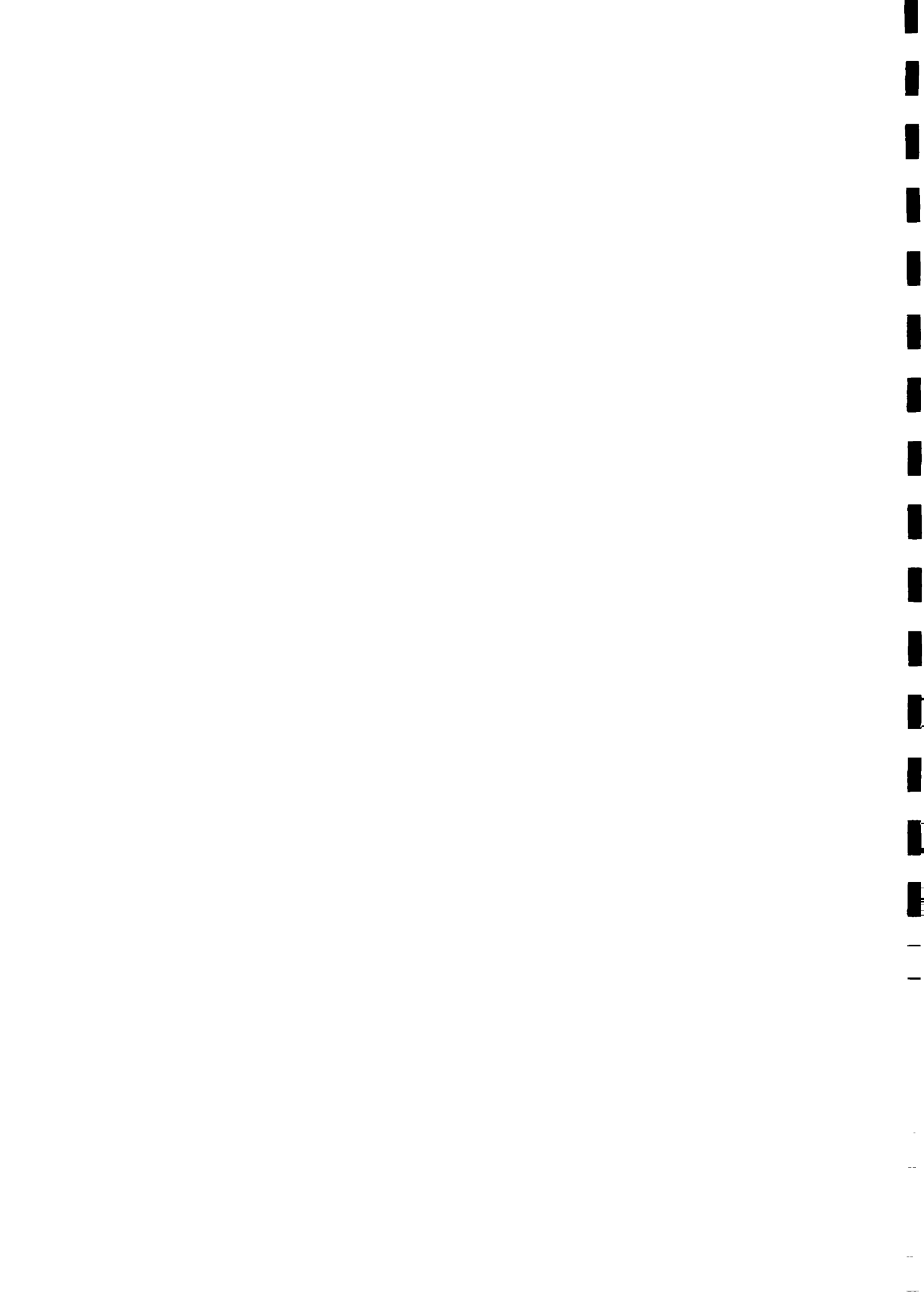


TABLE 8A

AGE DISTRIBUTION OF WATER FETCHERS IN THE PROJECT AREA

| AGE GROUP OF WATER FETCHER | P R O J E C T A R E A | | | | | |
|-------------------------------|-------------------------|--------------|-----------------|--------------|-----------------|--------------|
| | KAPECHA 1 | | KAPECHA 2 | | BAMBA | |
| | NO. IN SAMPLE | % | NO IN SAMPLE | % | NO IN SAMPLE | % |
| 0-5 yrs | 0 | 0.0 | 1 | 0.7 | 2 | 0.9 |
| 6-15 yrs | 39 | 28.1 | 27 | 17.6 | 50 | 23.6 |
| 16-25 yrs | 43 | 30.9 | 48 | 31.4 | 75 | 35.4 |
| 26-35 yrs | 28 | 20.1 | 41 | 26.8 | 60 | 28.3 |
| 36-45 yrs | 20 | 14.4 | 24 | 15.7 | 20 | 9.4 |
| 46-55 yrs | 9 | 6.5 | 10 | 6.5 | 5 | 2.7 |
| above 55 yrs | 0 | 0.0 | 2 | 1.3 | 0 | 0.0 |
| TOTALS | 139 | 100.0 | 153 | 100.0 | 212 | 100.0 |

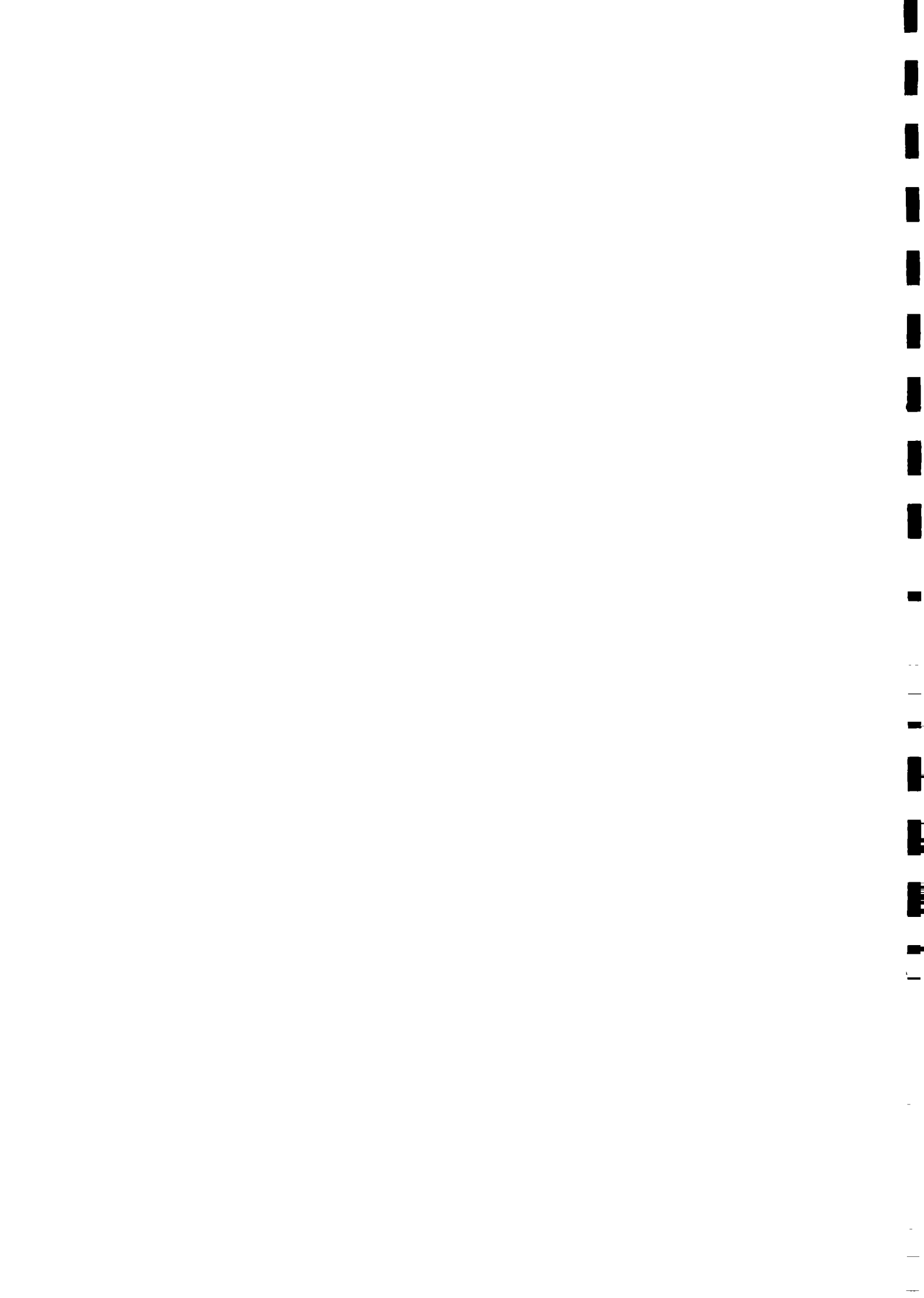
Source : sample survey

TABLE 8B

PERCENTAGE OF HOMESTEAD MEMBERS INVOLVED IN FETCHING WATER

| PROJECT AREA | KAPECHA 1 | KAPECHA 2 | BAMBA |
|--|-----------|-----------|-------|
| Number of water fetchers in sample | 139 | 153 | 212 |
| Number of homesteads in sample | 464 | 515 | 831 |
| Water fetchers as % of homestead members | 30.0 | 30.0 | 25.5 |

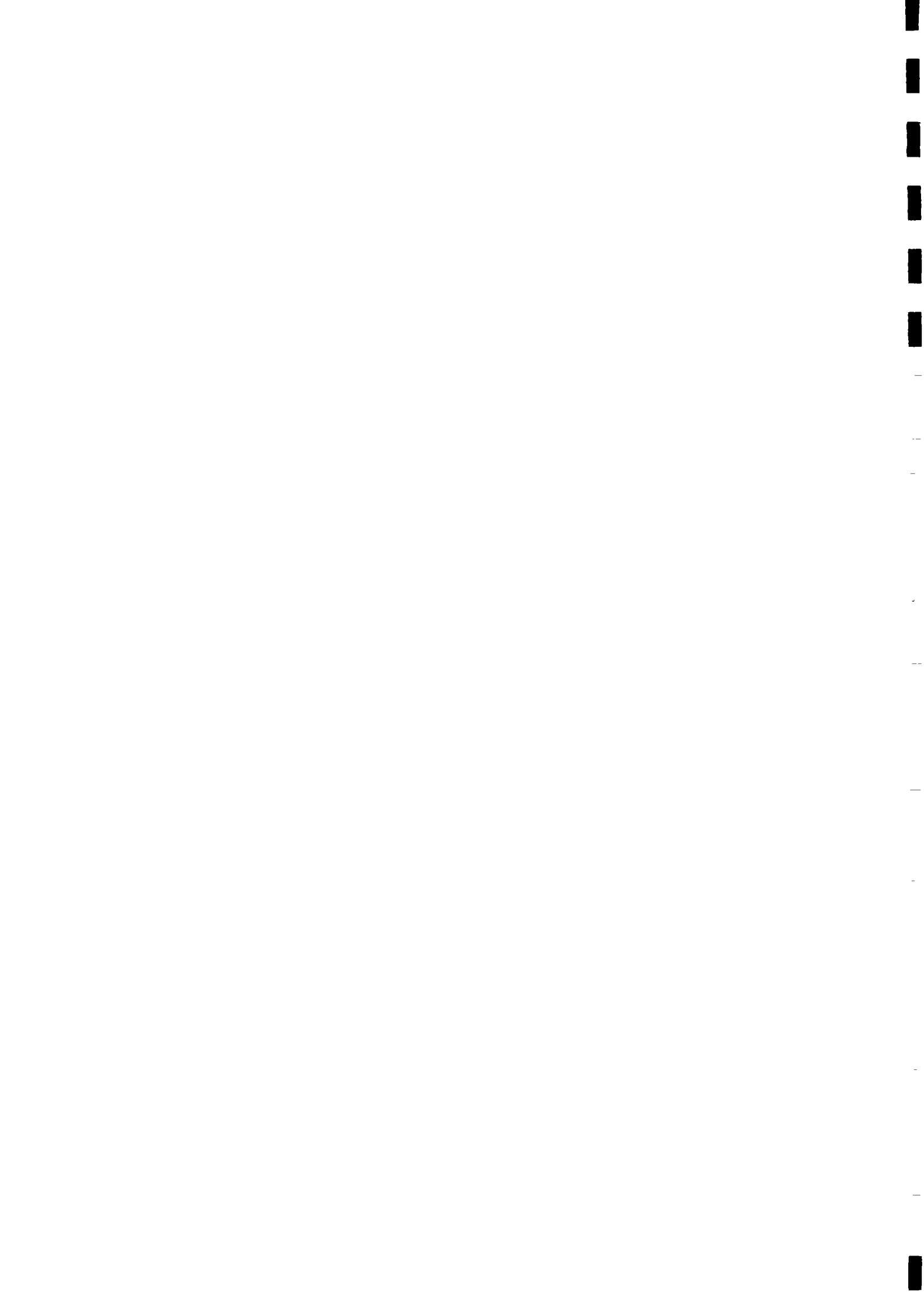
Source : Sample Survey



4.2 Table 8B shows that in Kapecha 1 and Kapecha 2, roughly 30% of members of homesteads were involved in water fetching activity. In Bamba the percentage was slightly lower that is 25.5%. Table 8A helps to explain the reason why the percentage of water fetchers in Bamba was slightly lower than in Kapecha 1 and Kapecha 2. Clearly, there was a greater tendency for older people, that is above 36 years of age, to get involved in water fetching operations in Kapecha 1 and Kapecha 2. In Bamba 87.0% of water fetchers were below 36 years of age. Corresponding figures for Kapecha 1 and Kapecha 2 were 79.0% and 76.0% respectively. The tendency to use relatively younger people in Bamba may have been dictated by the relatively longer distances which have to be covered in an effort to obtain water. In fact from table 8, it has been worked out that the average age for fetching water was 24.5 years in Kapecha 1, 26.6 in Kapecha 2 and 23.6 years in Bamba.

Frequency of water fetching activity

4.3 In all zones of the project area, the most commonly used containers to fetch water was the 20 litre plastic jerrycan which was normally carried on the head by females. Mostly because of lack of storage facilities, water had to be fetched 7 days a week, irrespective of weather conditions. In Kapecha 1, each water fetcher generally went for water 2 turns (mode) in a day during the dry season, with a range of



1 to 4 turns. However during the wet season the water fetcher mostly went for 1 turn (mode) in a day with a range of 1 to 3 turns per day. In Kapecha 2, survey results showed that both during the dry and wet season, the number of turns water was fetched per person, per day ranged from 1 to 3, with a mode (most frequent) of 2 turns per day, irrespective of weather conditions. In Bamba, the number of turns each person fetched water per day ranges between 1 and 3 with a mode of 2 turns during the dry season, but during the wet season, a person would fetch water between 1 and 4 turns in a day with a mode of 2 turns a day.

Distances covered in an effort to obtain water

4.4 Table 9 below summarises the characteristics brought to light by the survey with regard to distances travelled to and from water sources by water fetchers for each trip or turn of water fetching.

TABLE 9

DISTANCES TRAVELLED BY WATER FETCHERS EACH TURN (TO AND FRO)
WHEN FETCHING WATER IN THE PROJECT AREA

| CHARACTERISTICS | KAPECHA 1 ¹ | | KAPECHA 2 ¹ | | BAMBA | |
|-----------------|------------------------|-----|------------------------|-----|-------|-----|
| | DRY | WET | DRY | WET | DRY | WET |
| Range (Kms) | 9.0 | 6.9 | 14.0 | 7.0 | 40.0 | 4.2 |
| Median (Kms) | 6.0 | 5.6 | 8.0 | 3.0 | 13.0 | 3.0 |
| Mean (Kms) | 4.2 | 3.8 | 7.9 | 2.4 | 13.5 | 1.7 |

* For Kapecha 1 and Kapecha 2 the distances recorded were those covered by water fetchers prior to installation of pipe line by KIWASAP.

Source : Sample Survey



- 4.5 Survey results revealed that prior to KIWASAP's intervention in Kapecha 1, people would cover between 1.0 and 10.0 kms each trip (to and fro) in search of water during the dry season. This gave a range of 9.0 kms. The results also revealed that while the mean distance covered by water fetchers in the dry season was 4.2 kms, in actual fact, 50% of people covered 6 kms and above (median) each trip during the season.
- 4.6 In the case of Kapecha 2, prior to KIWASAP'S entry into the zone people would travel between 1.0 and 15.0kms to and fro each trip to obtain water, giving a range of 14.0kms for the dry season. The mean and the median distances travelled during the season were 7.9kms and 8.0kms respectively.
- 4.7 According to the sample survey, for Bamba during the dry season people travelled between 42.0kms and 2.0kms to and fro each trip to obtain water. On average the distance travelled in search of water was 13.5kms each trip and 5% of people fetching water covered more than 13.0kms in the exercise.
- 4.8 Needless to mention the distances travelled to fetch water during the wet seasons were somewhat shorter than those covered during the dry season as table 9 depicts. However, Kilifi district being a semi-arid area, the wet season is very short indeed. Moreover,



several years may go by before a wet season occurs. Thus the survey team took the distances travelled during the dry season as being typical of the area.

Types of sources of water available

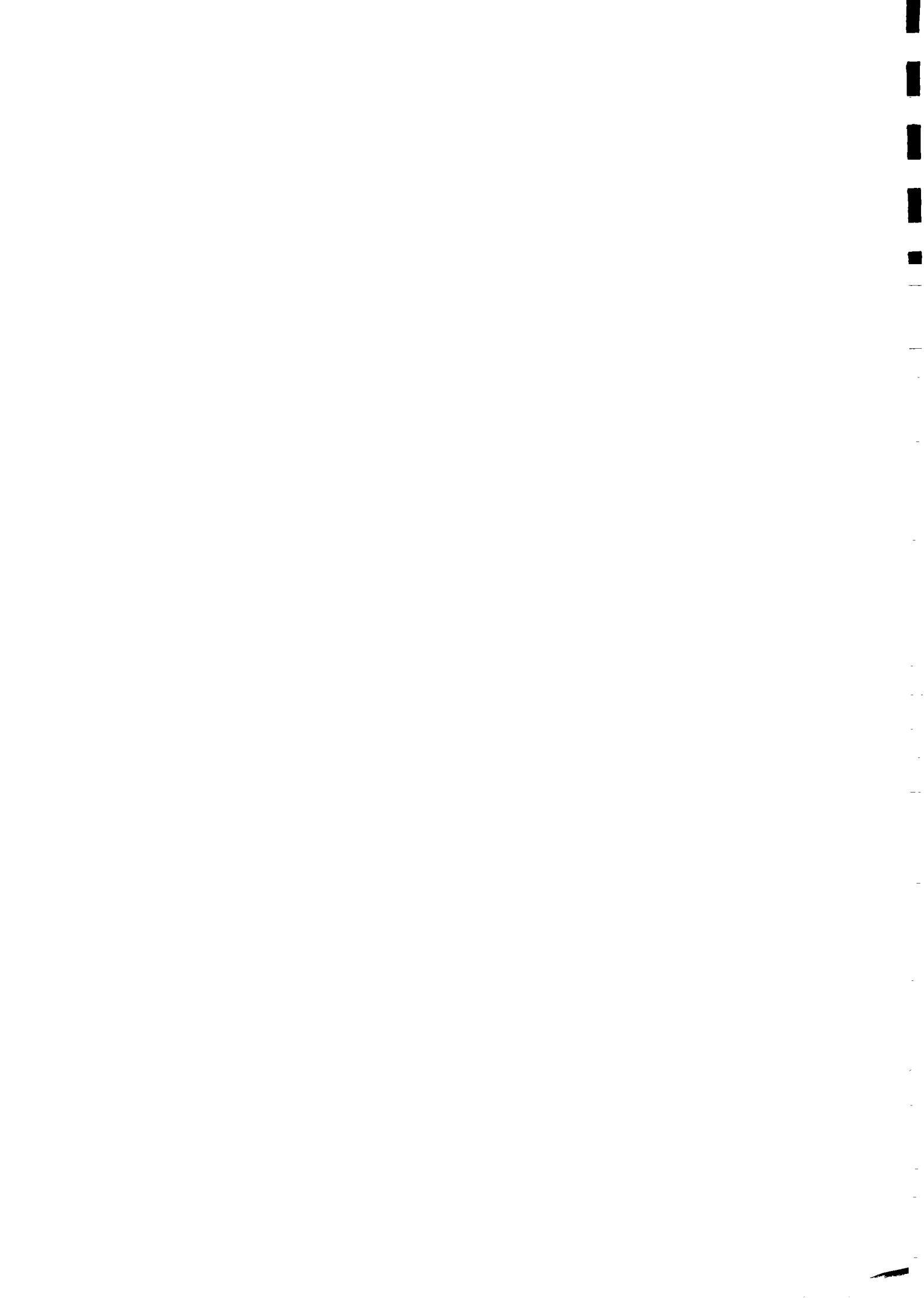
4.9 An attempt was made to record the types of water sources available to the people in the project area. Table 10 below is a summary of the attempt.

TABLE 10
TYPES OF SOURCES OF WATER AVAILABLE
IN THE PROJECT AREA

| TYPE OF WATER SOURCE | KAPECHA 1 | | KAPECHA 2 | | BAMBA | |
|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | DRY SEASON % | WET SEASON % | DRY SEASON % | WET SEASON % | DRY SEASON % | WET SEASON % |
| Shallow well | 30.2 | 12.1 | 28.2 | 30.6 | 20.5 | 12.2 |
| Puddle | 0.0 | 41.5 | 0.0 | 38.9 | 18.2 | 41.5 |
| Pan/dam | 7.0 | 41.5 | 10.3 | 2.8 | 29.5 | 41.5 |
| Tap | 9.3 | 0.0 | 30.7 | 0.0 | 2.3 | 0.0 |
| Stream | 53.5 | 4.9 | 28.2 | 27.8 | 29.5 | 4.9 |

Source : Sample Survey

4.10 The table shows that in Kapecha 1, during the dry season, shallow wells and streams were the most popular sources of water for the people, before KIWASAP showed up in the area. However during the wet season, people made use of puddles (depressions dug by hand or occurring naturally) and pans or dams. Naturally use of puddles near homes saved on long distances to other sources of water.



4.11 In Kapecha 2 there appears to have been some anomaly in the data with regard to use of tap water by 30.7% of population during the dry season. But the value of shallow wells, puddles and streams during the wet season is revealed.

4.12 The results for Bamba in this respect show the near absence of tap water almost throughout. The value of puddles and pans/dams during the wet season is very well portrayed.

4.13 Closely associated with types of water sources is the quality of water. Doubtlessly the quality of water drawn from puddles, pans and streams is extremely dirty (almost brown). The survey team observed people drinking brown water drawn from hand dug pans in Bamba. Both in Bamba and Kapecha 2, human beings and livestock were observed drinking side by side.

Water consumption per capita

4.14 It was difficult to assess the quantity of water consumed by people during the wet season mainly because of roof catchments of water and water fetched from puddles within the homestead compounds which people do not care to remember at all. Thus the survey team focused on water consumed during the dry season. Table 11 below summarises the situation in the project area:



TABLE 11

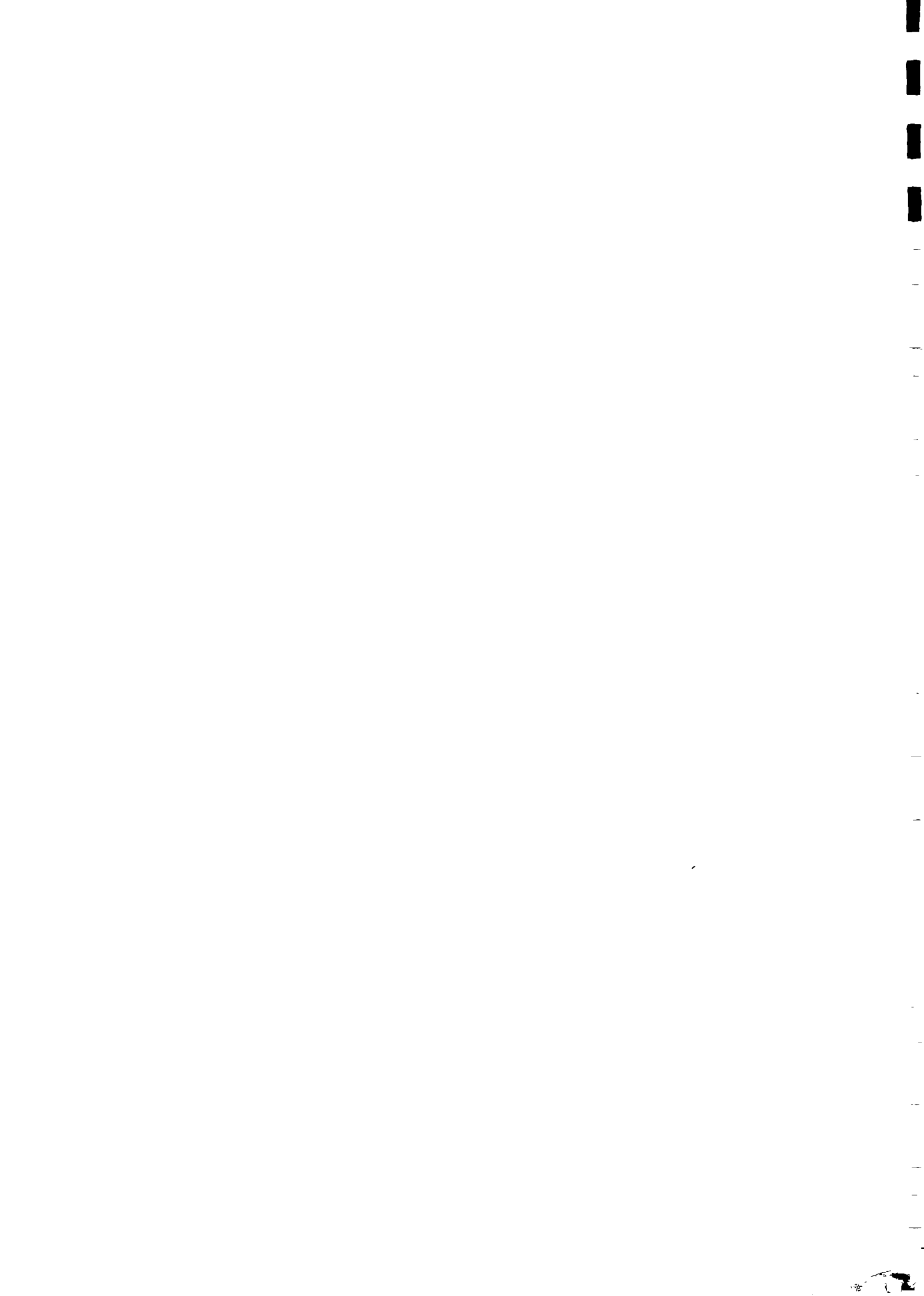
WATER CONSUMPTION PER CAPITA IN THE PROJECT AREA

| CHARACTERISTICS | KAPECHA 1 | KAPECHA 2 | BAMBA |
|---|-----------|-----------|---------|
| Quantity of water fetched per week in sampled homesteads (litres) | 32,799 | 39,958 | 54,107 |
| Quantity of water fetched per day in sampled homesteads (litres) | 4,685.6 | 5,708.3 | 7,729.6 |
| Number of people in sampled homesteads | 464 | 515 | 813 |
| Water consumed per person per day (litres) | 10.1 | 11.1 | 9.3 |

Source : Sample Survey

4.15 The survey results show that an average person in Kapecha 1 consumed 10.1 litres of water per day during the dry season while that of Kapecha 2 consumed 11.1 litres per day. In Bamba, the rate of consumption of water per day was at 9.3 litres per person during the dry season. The figures compared very unfavourably with international averages which show that an average Indian consumes 25.0 litres of water per day while an average Briton consumes 125.0 litres of water per day.*

* Source: J. Button, How to be green; Friends of the earth publication; 1989.



5.0 PIT LATRINE FACILITIES AVAILABLE IN THE PROJECT AREA.

Institutional pit latrines.

5.1 The survey team focused on pit latrines owned by schools for use by pupils by December 1990. Tables 12, 13 and 14 illustrate the position with respect to schools with which KIWSAP had formal dealings by July, 1991.

TABLE 12

PIT LATRINE FACILITIES FOR
PUPILS IN KAPECHA1 (DEC 1990)

| SCHOOL | STUDENT POPULATION | PIT LATRINE FACILITIES | STUDENTS PER LATRINE |
|-----------------------------|-----------------------|------------------------------|----------------------------|
| Kadzinuni Primary School | 535 | 11 | 48.6 |
| Kapecha Primary School | 300 | 1 | 300.0 |
| Totals | 835 | 12 | 69.6 |

Source : Sample survey



TABLE 13

PIT LATRINE FACILITIES FOR
PUPILS IN KAPECHA2 (DEC 1990)

| SCHOOL | STUDENT POPULATION | PIT LATRINE FACILITIES | STUDENTS PER LATRINE |
|----------------------------|--------------------|------------------------|----------------------|
| Makata Primary School | 270 | 1 | 270.0 |
| Bokini Primary School | 78 | 1 | 78.0 |
| Dindiri Primary School | 250 | 3 | 83.3 |
| Pingilikani Primary School | 300 | 4 | 75.0 |
| Totals | 898 | 9 | 99.8 |

Source : Sample survey

TABLE 14

PIT LATRINE FACILITIES FOR
PUPILS IN BAMBA (DEC 1990)

| SCHOOL | STUDENT POPULATION | PIT LATRINE FACILITIES | STUDENT PER LATRINE |
|--------------------------|--------------------|------------------------|---------------------|
| Kidemu Primary School | 300 | 1 | 300.0 |
| Mirihini Primary School | 315 | 4 | 78.8 |
| Mitsmerin Primary School | 200 | 2 | 100.0 |
| Bamba Primary School | 746 | 6 | 124.3 |
| Chapungu Primary School | 292 | 1 | 292.0 |
| Jila Primary School | 300 | 2 | 150.0 |
| Katendwa Primary School | 200 | 0 | 0.0 |
| Maryango Primary School | 200 | 2 | 100.0 |
| Total | 2553 | 18 | 141.8 |

Source : Sample survey

5.2 The above tables show that by December 1990, in the entire project area, only one school had achieved the minimum requirements for the Ministry of Education with respect to number of students to pit latrine ratio of 50:1. Worse still some of the schools did not have any latrine facilities for teachers. The picture



is very grim indeed, especially when viewed against the observation that drinking water is obtained from puddles, pans and streams rather than artesian wells or taps.

Pit latrines in homesteads:

5.3 The table below shows the number of homesteads with pit latrines in the project area.

TABLE 15
PIT LATRINE FACILITIES IN HOMESTEADS

| | KAPECHA 1 | KAPECHA 2 | BAMBA |
|--|-----------|-----------|-------|
| Homesteads with pit latrines in sample | 5 | 4 | 2 |
| Sample size (homesteads) | 39 | 43 | 38 |
| % of homesteads with pit latrines | 12.8 | 9.3 | 5.3 |

Source : Sample survey

5.4 The data shows that in Kapecha1 12.8% of homesteads had a pit latrine. In Kapecha2, 9.3% of homesteads had and in Bamba the percentage of homesteads with pit latrines was 5.3%. It is worthwhile to note that all the pit latrines seen in homesteads by interviewers were not the VIP type recommended by KIWASAP.



5.5 The situation in the project area is much worse when viewed in terms of numbers of people per pit latrine. That approach is depicted in table below.

TABLE 16
NUMBER OF PEOPLE PER PIT LATRINE
IN THE PROJECT AREA

| PROJECT AREA | KAPECHA 1 | KAPECHA 2 | BAMBA |
|--|-----------|-----------|-------|
| Number of people in homesteads sampled | 464 | 515 | 831 |
| Number of pit latrines in homesteads sampled | 5 | 4 | 2 |
| Number of people per pit latrine | 93.0 | 104.0 | 416.0 |

