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DEPARTMENT OF SOCIAL AND ECONOMIC GEOGRAPHY

UNIVERSITY OF LUND

PILOT STUDY OF WATER SUPPLIES IN LEMBENI WARD,
MWANGA DISTRICT, KILIMANJARO REGION.
A PRELIMINARY REPORT FROM FIELDWORK.

AUGUST 1981

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 Kilimanjaro region

1. BACKGROUND

1.1. The project

This paper is based on fieldwork in Lembeni Ward, Mwanga District, Kilimanjaro Region in February - March 1981. The fieldwork is part of a larger project "Domestic water supplies: A vital component in Tanzania's rural development. A consumer-orientated study of selected water schemes in four regions" which is financed by SAREC (Swedish Agency for Research Cooperation with Developing Countries).

The objectives of the project are to investigate as many aspects relevant to the development of rural domestic water supplies as possible through studies of existing schemes. An attempt is made to obtain the kind of precise information necessary for understanding the impact of water supply (or non-supply) on the village level, and to define what factors contribute to the success or failure of water supply schemes. (More detailed information on the project can be obtained in the progress report 1981-01-15.)¹⁾

The project is initiated through a pilot study of water supplies in Lembeni Ward at the village level. The objective of the pilot study is to ascertain, in cooperation with the consumers, the most relevant aspects for further study. The water schemes will be studied in different seasons in order to gain as complete a picture of the water supply situation as possible. The fieldwork described in this report is part of this pilot study. Follow-up fieldwork is planned.

The immediate aims of this fieldwork period were to try to establish good contacts with the villagers to facilitate more informal discussions in later fieldwork periods; to collect information on the water supply in general; to collect information on important aspects of water use through discussions at the household level; and to show the variation of water supply situation at the local level in a very small area.

1) Andersson, Ingvar & Hannan-Andersson, Carolyn. Domestic water supplies: A vital component in Tanzania's rural development. A consumer-orientated study of selected water schemes in four regions. Progress Report 1981-01-15, Lund: University of Lund, Department of Social and Economic Geography 1981, 41 p.

1.2. The area: Lembeni Ward, Mwanga District

Mwanga District

Mwanga District is a topographically diverse area within Kilimanjaro Region in north-eastern Tanzania. The central part of the district consists of a narrow broken mountain massif, North Pare Mountains, which runs between Mount Kilimanjaro and Usambara Mountains, roughly parallel to the Kenya-Tanzania border. The district's peripheries are made up of arid plains which surround the mountains on all sides. The plains have an altitude of about 600 to 900 metres above sea-level. The interior of the massif is a broken plateau with altitudes 1200-1800 metres.

Rainfall is unevenly distributed. It is sparse on the plains (mean annual rainfall less than 500 mm) and on the slopes on the western side which are in the rain shadow. In the interior of the massif the yearly rainfall may be 1000-1280 mm/year. Several streams drain the interior into Pangani river west of the mountain range. Only a few of these mountain streams are permanent when reaching the plains. In the sixties a dam was constructed across the Pangani, thus creating a large reservoir, Nyumba ya Mungu Dam. The rainfall is mainly concentrated to the months November, December and April, May.

Semidesert conditions prevail on the plains. On the western side we find bushland and thicket, the vegetation becoming more lush with increasing altitude. There are remnants of rainforest still to be found in the higher areas.

The majority of the population lives in the highland zone where there is strong land pressure. The typical habitation pattern here is dispersed homesteads. People on the plains live in a narrow belt close to the Moshi-Tanga road. Here they tend to live in villages. The settlement on the plain is of recent date, less than 50 years.

The people living around Nyumba ya Mungu Dam live mainly by fishing. Apart from these people, who are recent immigrants to the area, the Wapare, who are mainly agriculturalists, are the dominant group. Most homesteads

keep a few cattle, goats, sheep and hens. The staple crop in the highlands is bananas but beans and coffee are also grown. On the plain, west on the mountains, large sisal estates are found. The most important crop on the plain is maize. Some of the fields here are owned and cultivated by people living in the highland zone. The use of tractor for cultivation is widespread. A number of Wapare living in the plain also keep big herds of cattle.

Lembeni Ward

Lembeni Ward is situated in the central part of Mwanga District and includes both the highlands and the plains. The population, according to the latest census (1978), was 13.250. The ward consists of several villages of which three were studied in the fieldwork period, namely Lembeni, Kiskibaha and Kichwa Ngombe. At a later stage more villages will be included, for example Kisangara and Kisangara Juu.

Kisangara and Lembeni are both located on the plain along the Moshi-Tanga road. The character of these villages is more urban than rural with a close settlement pattern. At Kisangara there is a private sisal estate with labour camp.

Lembeni village is the service centre and developed as a result of the railway which was built 1912 between Tanga and Moshi. Apart from a railway station, there are also relatively well developed community facilities such as a primary school, dispensary and Post Office. Many commercial activities take place in Lembeni, for example we find 8 private and one cooperative shop and several hotels and many bars. There is also a relatively large market held in Lembeni once a week with people coming from the surrounding areas. The main cluster of Lembeni contains about 1000 people.

The local "know-how" in Lembeni village is impressive. Apart from "fundis" with the traditional skills like shoemakers and tailors, you find "fundis" repairing bicycles, radios, watches, tractors and lorries.

Kisangara Juu is an old dispersed settlement in the highlands connected to Kisangara via a steep windy road, which is practicably impassible in the rainy season. The main economic activities are based on agriculture. The dominant cash crop is coffee.

Kisekibaha is situated at the foot of the mountain close to a small mountain stream and a much used footpath leading up to the highlands. It is a small village composed of approximately 30 households. The economy is mainly based on agriculture but most villagers also keep a number of cows, goats and sheep. The land close to the stream is ideal for sugarcane and most of the households are engaged in extracting sugarcane juice which is sold in Lembeni for Pombe brewing. Kisekibaha can be characterized as a conservative Wapare settlement. A mission located nearby seems to have had little impact on village life even after more than 10 years of interaction. However, since the completion of the fieldwork a cooperative shop has been opened.

None of the above villages were to any noticeable degree affected by the villagization which took place 74-76. However, Kichwa N'gombe was created in response to this campaign. All major cattle owners were settled in one village. Previously these people lived scattered over the area, sometimes close to cultivated land which led to conflicts. The main reason for the selection of the village site seemed to be accessibility to grazing areas; much less consideration was given to water for domestic use and animals. The villagers had been promised a water supply when they were moved to the present site. To date nothing has been done to solve the water problems experienced. The settlement pattern in Kichwa N'gombe is sparse.

1.3. Water supplies in Lembeni Ward

Due to the differing physical and socio-economic conditions the water supply situation in Lembeni Ward is varied. We find two extremes: Kichwa N'gombe where women walk 5 hours to collect water and Lembeni Village where several households have their own private connections to

the pipeline and running water in kitchen and shower. Although there are a number of improved water supplies in the ward, many people still rely on traditional sources.

Traditional supply in Kisangara Juu

In the densely populated highland zone at Kisangara Juu, people collect water from mountain streams or furrows. The furrow system, used both for domestic use and irrigation, is highly developed, although less complex than those systems of the neighbouring Wachagga on Kilimanjaro. There is obviously a big risk for pollution in such a system where the furrows and streams pass close to homesteads and across fields.

The Kisekibaha pipeline

The areas below the mountain have very few reliable sources of water and a number of improved water supply schemes have been built. The oldest supply was built for the purpose of supplying water to fill the steam engines at Lembeni village. Provision was also made for domestic supplies for the railway staff. A weir and an open tank on the ground was constructed at Lembeni River at the foot of the mountain. The water not needed for the railway was allowed to overflow the weir through a pipe. This turned out to be a very reliable source and people settled in the immediate vicinity (Kisekibaha Village). The water was of good quality as the intake was fenced in and no people lived on the slopes. Today however, the fence is broken, goats and sheep drink in the stream above the weir and as a result the water is polluted.

From the intake at Kisekibaha a gravity pipeline leads down to the station where 4 standpipes are erected. As most trains today are diesel-powered the main use is for domestic purposes. Today Lembeni is also served with a government pipeline (Chanjale Pipeline) but as this is frequently dry the entire population of the village depends on the standpipes at the railway station.

The Kisekibaha pipeline is very reliable. The reasons for this can be

that it is technologically simple, small in scale and that the maintenance is the sole responsibility of the railway. An attendant is employed and it is a part of his daily duty to check the line from tap to intake. As the pipeline is under the stationmaster he also has the power to hinder the villagers from using the taps. This happens when the people queuing for water are too noisy. Then people are forced to use polluted sources like pools in the riverbed. Queuing up to 30 minutes is common at peak hours when Changale pipeline is out of order.

Water supply to Kisangara Sisal Estate

A large part of the population at Kisangara depends on the water supply to the private sisal factory. Public standpipes have been provided in the labour camp. Today Kisangara is also served by Changale pipeline but when this is out of order the whole population relies on the private pipeline. As was the case with Kisekibaha pipeline the old pipeline for the sisal estate is more reliable than the government supply.

Chanjale Pipeline

As early as the 50s the government carried out surveys to provide water for the drier areas below the mountain. The main purpose was to stimulate economic activities in the form of cattle raising. A borehole with pump and engine was proposed between Kisangara and Lembeni. The project was, however, never carried out. In 1969 the question of the water supply was raised again. An Ujamaa cattle farm was proposed for the uninhabited area at Mkizingo along the road to Nyumba ya Mungu. The survey team suggested water be taken from the perennial Chanjale River and a gravity pipeline to be built to Mkizingo which would also supply Kisangara, Lembeni and other minor settlements along the road. Survey and design was carried out and RWE in Kilimanjaro Region started construction at the end of 1971. Details about Chanjale water supply can be found in Appendix 2. The layout is shown on the map 1.

The village leaders were not involved to any substantial degree in the planning of the project. When the location of public standposts became known, villagers asked for additional standpipes and branchlines. Their

demands were in most cases met by the water technicians. The Ministry of Water had, in 1971, given guidelines to the regions that unskilled labour, like trench digging, should be carried out on a self-help basis. The response from the villagers on participation was, however, poor. Volunteers turned up to dig trenches near the villages but were not interested to participate in places where no people lived and the soil was hard. Eventually paid labour (from the nearby villages) had to be employed.

The impression of Chanjale Water Supply 10 years after construction is a mixed one. The northern part of the pipeline is fairly reliable. Kisangara gets water most days while Lembeni is either without water or the water comes with very low pressure which causes queueing at the standpoints. The line along the main road to the south had been out of order for 7 months. There is an attendant employed by the District Water Engineer to maintain the pipeline, but since he is an outsider the relations with the villagers appear to be strained.

When the pipeline is working there are some obvious benefits. Distance has decreased considerably for most households. Compare map 2 and 3. The dispensary and most hotels have tapped water inside. In the school-yard there is also a much used standpipe. Although the causes cannot be established, the fact remains that all villages supplied through Chanjale pipeline (which worked at the time) were never infected by cholera, while neighbouring villages were hard hit.

The people in the new settlement Kichwa Ngombe have not benefitted by an improved water supply although they were promised such a supply by government officials when they moved to the present site 76/77. There are no records of any future plans for water supply.

During the rainy season and immediately after, people and cattle use water from the same pools. These soon dry up and for most of the year, 7-9 months, the women are forced to walk to Lembeni station, a round trip which takes 7 hours. The time required to bring the animals to water is even longer - about 9 hours.

2. METHOD: PROCEDURES AND CONSIDERATIONS

2.1. Structured questionnaires vs informal discussions

The method used in the pilot study is to observe and listen to the villagers themselves. For this reason no structured questionnaire has been prepared. While such questionnaires do have some value in collecting information, they are inadequate as a method of gathering information on the real situation regarding the relationship man-water at the village level. Some aspects, such as access to water, actual use of water supplied, maintenance and operation, etc. can be easily observed or the necessary information gained through questionnaires. However other aspects and problems, perhaps the most important ones, such as traditional attitudes and beliefs concerning water, traditional sources and water-use patterns, the role and attitudes of women, child care, health habits, etc. can only be studied through real contact with the villagers. Thus a more satisfactory method involves periods of fieldwork in the villages studied, visiting the same villages and the same households more than once (as opposed to brief village surveys). This method allows for direct observation and real informal contact with the villagers -- i.e. unstructured discussions in which the villagers themselves can present aspects of importance to themselves.

Since one member of the project team was in the area for 6 weeks the fieldwork period gave good opportunity to begin to establish contacts. However, since it takes time to build up an informal relationship, and because of language barriers (the discussions were mainly held in Kipare), some use of questions had to be made. Instead of following a strict questionnaire, a compromise was reached by working out "areas of interest" and checking that each visit to the different households gave information on these aspects. These "areas of interest" included:

- household composition
- water collection
- water in the home
- food and cooking
- health and water
- sanitation

- non-domestic use of water
- general ideas about water supply - including quality, possible improvements
- general background information

A more detailed list of the possible questions in these areas of interest is included as Appendix 1.

2.2. Scope of the fieldwork period

The fieldwork was carried out during a 6 week period. One team member was in the area for 6 weeks and the other team member for 2 of the 6 weeks. During this time contacts were made and information was gathered in the following ways:

- discussions with village committee members - chairman, secretary, manager
- discussions with women in maendeleo groups (women's development groups)
- meetings with villagers on water in general
- discussions with individual households to discover water-use behaviour & attitudes, etc
- observations of sources, household use of water and village life in general

Obviously the scope of this short fieldwork period is limited. The main aim, as stated before, was to establish contacts to open the way for more informal discussions in subsequent fieldwork periods (2 planned). While some interesting information was collected no attempt will be made to generalize or arrive at conclusions on the basis of this information. However, some interesting tendencies and unanswered questions can be raised.

3. SOME PRELIMINARY FINDINGS AND UNANSWERED QUESTIONS

Given the approach as described in section 2, the aim was not to attempt to hold discussions with all households, or even to find a representative group of households. The households selected for individual discussions cannot be said to be representative. They were mainly chosen through contacts with the maendeleo groups. The views and statements of these households must be seen as describing their own individual situations only. No generalisations are attempted. However where interesting tendencies or general practices seem evident they can be mentioned and unanswered questions can be raised.

3.1. Information on "areas of interest"

Some of the information gathered on the "areas of interest" listed in section 2.1 is given below. The information will be further analysed after the follow-up fieldwork planned for early 1983.

1. Household composition

Average household size was 7-8 persons, mainly parents with children staying at home. This would appear to be high, probably depending on the fact that the households were well established. Few young families were included in this fieldwork period.

The majority of men had one wife only. Where there were two or more wives, they and their children were counted as separate households. Two women had no husbands.

An interesting aspect was the child-spacing practice. Most families had children at regular two-yearly intervals.

2. Water collection

Who collects:

Water was collected by the women and children (mostly girls). Only one man reported that he also collected water, and then it was much less than women usually carry, 8 litres as opposed to 20 litres. (It is not certain that this water was used for domestic purposes.) Men sometimes collect

for non-domestic purposes, e.g. for animals, tractors, pombe brewing (for sale). Whenever men were observed carrying water they were always using other methods than carrying it on their heads. They used such innovations as bicycles, wheelbarrows, yokes. A question raised is: why don't women find other ways to carry water? Is the tradition of carrying on the head so ingrained? Is carrying on the head the easiest way? Are bicycles, wheelbarrows, etc, outside their means, i.e. always used by men for something else?

Small boys were reported to collect water for domestic purposes until they went to primary school. After commencing school they only collected for non-domestic purposes, for calves, etc.

An interesting point raised by several women was the fact that water collection had become more of a burden after the introduction of general primary school for all children. Children were no longer able to help as much with water collection or other domestic activities as they had in the past.

The greater the distance to the source the more family members were involved in water collection. In Lembeni only the women collected, with a little help from the girls. The women went 5-10 times a day. In Kichwa Nğombe it was only possible to make two trips a day (because of the great distance) and more household members were involved in collecting.

Water collection as a burden:

Water collection was considered a burden by the women. Complaints about distance to source were frequent, although actual distance complained about varied from 20 minutes to 7 hours from the source (time for round trip - not including time taken in queueing, talking, etc.)

When collected:

A set pattern could be observed in times for collecting water. All the households collected early in the morning and late afternoon. Most also collected in the middle of the day. It was also common to combine water

collection with other activities outside the home, e.g. coming from the shamba, market, church and children coming from school. Those who lived close to the source were less bound by set times for collection. They collected when they needed water.

Amounts collected:

Women carried 20 litres and girls (13 years and under) carried approximately 10 litres each trip.

The amount of water carried home daily varied from 9 l/person and day to 22 l/person and day. The largest amount is collected in Lembini when the nearby domestic point is working and the smallest amount in Kisekibaha (near a reliable source) and Kichwa Nḡombe (very far from source).

How collected:

Plastic buckets (20 litres) seemed to have made a breakthrough, almost completely replacing the debe. They were preferred by the women because they don't rust and last longer. However they are very expensive and are currently not available. The question could be raised if they are more hygienic than debes, given the fact that they are more easily scratched. Other containers used for collection were gourds, debes, smaller plastic containers.

3. Water in the home

Storage:

Drinking water is always stored in clay pots, and in most cases, water for cooking as well. Water for other household uses was kept in the plastic buckets it was collected in.

Water uses:

The households used water for the usual domestic purposes, i.e. drinking, cooking, washing up, washing clothes, washing family members and making pombe for own use. The water uses could be divided into:

water used at the source

washing clothes

washing themselves

water carried home for use there

drinking

cooking

washing up
for Community Water Supply

washing family members

making pombe

(some washing of clothes)

This seemed to be the general pattern. An interesting point for further study is the relationship between the distance from the source and the amount of water carried home for use there. It would seem to be logical to presume that the longer the distance the more water used at the source to save carrying it home. This did not always seem to be the case. Perhaps in extreme cases of distance more water is carried home for washing of household members since less members have time to wash at the source.

The water use pattern seemed to be very established and appears to vary only slightly with distance to source. It is obvious that there is no simple relationship between distance to source and amount carried home. Washing themselves at the source was common in Kisekibaha. Perhaps mainly because it is a smaller community and there is a certain amount of privacy at the source, with trees and bushes. There is also a special area for bathing. This "bath" was built by a teacher living in the area some years ago.

In Lembeni none of the households washed at the source. There is little privacy at a standpoint in the middle of the village or at the railway station.

4. Food and cooking

The general pattern was for a day-morning: tea or porridge; midday: ugali; evening: beans and maize mixture (pure). An interesting fact was that if sugar was not available people preferred to go without tea in the morning. The diet was more varied in Lembeni (perhaps more variety at the market, better income?) where fish and bananas were also included in the usual diet. It was calculated that about 30 liters was used for food preparation/day.

The fire was only lit three times a day - for each meal, to save firewood. This fact must be related to the low incidence of boiling water for drinking. There was some difference in incidence in the three areas. In

Lembeni all households talked to boiled water for drinking; in Kisekibaha most did not boil the water normally but they did at the time of the cholera outbreak; in Kichwa Ngombe they did not even boil the water during cholera. These patterns cannot be related to knowledge on the necessity for boiling water, since all households knew they should and seemed to have some idea (or often good idea) of why this was necessary. It would seem that the crucial relationship is with the time available and other demands on them. Obviously distance to source must be of crucial importance since most stated that they did not boil water because they did not have time. Another important aspect is the relationship to firewood situation. Since collection of firewood is another burden and firewood is scarce the fire is not kept going all day. Obviously motivation for boiling drinking water was received from varying sources, school, radio, maendeleo groups, relatives, Mtu ni afya campaign.

5. Health and water

Diañhoea in children was not given as a common problem. Fever (with a possibility that it was malaria) was rated number one problem. Bilharzia was only given as a problem by the people of Kichwa Ngombe (in spite of the fact that it is supposedly common in the area).

6. Sanitation

Latrines:

There seemed to be a tradition of latrines in the area. All households had own latrines, although the families with more than one wife shared one latrine between the households. In general the households had had latrines for more than 20 years and it appeared that even the previous generation had had latrines. Most stated that their present latrine had been built about 2 years ago. This would seem to indicate that they had built a new one at the time of the cholera outbreak.

Extremes in standard of latrines could be observed, from an indoor latrine with concrete floor, plastered walls and a tap for washing hands in Lembeni, to a simple latrine built with mud in Kichwa Ngombe which was used by 6 households (in a family with three wives and three sons living on the same compound).

Toilet training:

This was an interesting aspect for study, especially given the theory that children are the agents of contamination in the homes since they defecate anywhere before they are toilet trained. The faeces of small children is reported to be highly contaminating, and since it comes into contact with walls, furniture, clothing, utensils, etc, it easily spreads infection. Thus early toilet training is of vital importance.

A definite pattern could be observed. All children were toilet trained by 4-5 years. They began training around 3 years. They were taken to the latrine and taught to defecate beside the hole. They were helped by parents or older children. The faeces was then placed in the hole. With children under 3 years the faeces was collected and taken to the latrine.

It should be noted, in the context of toilet training procedures, that the latrines are extremely dangerous places for small children since they are often simply holes (up to 3 metres deep) with no adequate covering protection.

7. Non-domestic uses of water

Little water was carried home for non-domestic uses.

Animals: small amounts were carried for animals such as ducks, calves, hens, Larger animals taken to source.

Vegetable gardens: very little watering.

In Lembeni told by pump attendant that this was forbidden. Man with own connection watered often.

Pombe-brewing (for sale) This was done regularly in Kisekibaha but little water was required since they sell the juice only. Water is added in the bars.

8. General ideas about water supply

The people in general appeared to have a very good idea about the water supply situation. They were aware of the problems and possible solutions. A question raised in this context is why nothing is done to rectify the problems. It is possible that initiative has been taken from the people

and that they consider all improvements should be organized and financed by the government.

The problems experienced and solutions suggested:

Kisekibaha: Problem.

People complained, rightly, about the quality of the water and could trace the contamination to the fact that people and animals, (sometimes their own), were using the spring above the source.

Solution.

Construction of another intake and piped supply with stand-pipes in the village - a solution necessitating governmental inputs.

Lembeni: Problem.

Piped supply which is unreliable.

Solution.

1. Improved supply by taking additional water from the spring at Kisekibaha - with governmental inputs.
2. Replacement of pump attendant (presently from outside the village and answerable to the District Water Engineer in Mwangi) by a local man/woman who is responsible to the village council - necessitating action from MAJI.

Kichwa Ngombe: Problem.

Great distance to nearest standpoint in Chanjale scheme and very great distance to railway station when Chanjale scheme is not working (with resulting health/hygiene implications) and problems of obtaining water for cattle.

Solution.

1. Construction of new piped supply, taking water from the spring at Kisekibaha - governmental inputs.
 2. Construction of wells in nearby seasonal pools
- Expressed willingness to do construction themselves but project requires external inputs even for initiation.

9. General background information

All the men we talked with were peasants. Three were also businessmen and two kept cattle: No real information was gathered on the educational background so it is impossible to make any comment on relationship between educational level and water use.

Most of the women were involved, to varying degrees, in the maendeleo activities in the villages. Most of the women in Kisekibaha we talked with brewed pombe for sale in Lembeni.

3.2. General comments and questions

Behaviour when scheme not functioning

When the water scheme is not working in Lembeni the villagers use the old supply at the railway station. They complain about the quality, the distance the queueing and claimed that they use much less water when they have to go further. One woman claimed her water consumption was reduced by half. Perhaps this was only when the supply was interrupted for shorter periods?

Priorities of needs

While all those talked to were in agreement that improved water supply was needed, they were not always in agreement that this was their most urgent need.

Kisekibaha: Here the people wanted a dispensary first, followed by a cooperative shop and then improved water supply.

Lembeni: High priority was given to improving the water supply since they had been suffering from a breakdown lasting over a month. (The sight of taps in the village which don't work probably keeps this need constantly in mind.)

Kichwa Ngombe: Highest priority was given to the construction of a new water supply since they obviously suffered greatly in terms of enormous burden, health risks and problems of getting water for their cattle.

Relationship between water use and distance to source

The households themselves considered that those living closest to the source use more water than those living further away. However the results of our discussions do not indicate this. Those living further away used as much as those close, in some cases even more. The question is raised - why do people in Kisekibaha who are close to a reliable supply of reasonable quality use as little water as they do? It is obvious that a shorter distance to the source does not of necessity mean that more water is collected. The extra time made available can be needed for other activities, such as collection of wood, shamba work, etc.

Burden of water collection in relationship to total work burden of the women. Women spend many hours per week in working in the shamba and in collecting firewood, apart from usual domestic work such as cooking, cleaning, washing clothes and minding children. An improved water supply will not completely eliminate the burden.

The relationship between collection of firewood and collection of water is interesting. In the discussions held it appeared that these two activities were often related in the sense that those close to water had to walk long distances to collect firewood while those close to firewood were far from water.

Some examples of hours spent daily on collection of firewood and water in the different areas in Lembeni Ward illustrate the variety in time spent by different households on these two activities.

	hours collecting water day	hours collecting firewood/day
household 1 (extreme case)	11	1/2
Household 2	4	1
household 3	1/2	1 1/2

In some senses it is difficult to compare these two activities since water is something which must be collected every day or almost every day. Firewood, on the other hand, need only be collected once a week, or less

frequently as it is easily stored. So it is difficult to obtain accurate information on time spent collecting firewood as it is sometimes collected once a week, sometimes twice, etc. This was even more obvious in Lembeni where it is often impossible for the households to collect all their firewood themselves, because of distance to forests. They can collect some on the way back from the shmaba etc but many have to rely on vendors, or hire trucks and collect themselves. Thus they may use less time and effort but collection of firewood involves more expense for them. The relationship of interest here is time and effort Vs cost.

3.3. Practical aspects and implications for future fieldwork periods

Many difficulties were experienced in carrying out this fieldwork period. Not least was the achieving of the ambition to use informal discussions as opposed to structured questionnaires. Establishment of good relationships requires time and the fieldwork period was short. Language barriers were experienced. Discussions were held in Kipare since this is the language the women know best and which they use when discussing things close to them. It is hoped that by returning to the same area and revisiting the same households (as well as new ones) more information can be obtained through informal discussions.

Another problem was getting the women to talk in the discussions held in their homes. In the discussion in the maendeleo groups the women were very verbose. However in the homes it was the men who did most of the talking, unless questions were directly addressed to the women. It is hoped that in the coming fieldwork period it will be possible to talk to the women alone in the homes since the men now know what the project is about and the types of information sought. In fact it is important that the initial discussions included the men since water is a problem for the whole community, even if women do all the hard work in collecting, etc. Leaving the men outside the discussions would probably jeopardise the whole project.

The accuracy of some of the information collected can be questioned. It is obvious that incorrect information can be given through misunderstandings or perhaps more likely, incorrect interpretations can be made of the information given. The differences in backgrounds and concepts must

be taken into account. It was interesting to note that concepts which westerners have readily at hand, eg. number and ages of children, were things which had to be calculated. It is probably a common error to expect that all information is quantified as it is in western culture. Concepts have other dimensions.

It was especially difficult to obtain information on the amount of water collected if the women are questioned in general terms - "how many times a day is water collected". In retrospect it would seem more satisfactory to enquire about a specific day's water collection- eg. today's, yesterday's, since this concrete information is still at hand and does not require generalisations.

Some aspects which were overlooked will be taken up in coming fieldwork periods.

For example:

the use of rainwater

how much water used for washing themselves

if women carry water home for the men to wash themselves - even long distances.

4. THE CONTINUATION OF THE PILOT STUDY

Follow-up fieldwork is planned for early 1982. A short preparatory visit to prepare this fieldwork is planned for late 1981. The aspects studied in the first fieldwork period will be investigated at greater depth. Households which were studied will be revisited. Other households will be visited. The villages of Kisangara and Kisangara Juu will be included in the survey to show the great variety of water supply situations in the small area of Lembeni Ward. The report for the pilot study should be prepared by mid 1982. In addition, a follow-up study of the water supplies will be made in late 1982 to allow for study of the water supply situation in different seasons of the year.

The aspects of importance for further study will be incorporated into comparative studies in Shinyanga, Singida and Mwanza later in 1982 and results included in a final report on the project scheduled for production mid 1983.

AREAS OF INTEREST

1. HOUSEHOLD COMPOSITION

names of husband and wife/wives
number and names of children
ages of children
any children died - at what age
 of what
how many other people included in household

2. WATER COLLECTION

where collected
how far - how long time takes
how many trips a day - special times?
how many buckets a day
vessels for collecting
who collects
how much do children carry

3. WATER IN THE HOME

how stored
what used for - cooking
 washing up
 washing self/children
 for domestic animals
 etc

4. FOOD AND COOKING

how often eat a day
what are typical foods
how much water used to cook different foods
drink water with meals
cook drinking water - if not why not
 if yes - why
 since when
 who motivated them

how often fire going
who collects firewood - how often
 how long time

small babies - what they eat
 when do they begin drinking water
 do they always get cooked water

5. HEALTH AND WATER

common diseases of childhood
treatment
which diseases they know related to water
do they know why they are advised to cook water

6. SANITATION

latrine
how long
how old children when they begin to use it
what do small children do
when are babies toilet trained

types of latrines
how long last

how long they have had latrines in their families,
parents?
parents' parents?

7. NON-DOMESTIC USES

animals: ducks
 hens how many, where watered
 goats
 cows

shamba - how much, where, types of crops, water?
pombe

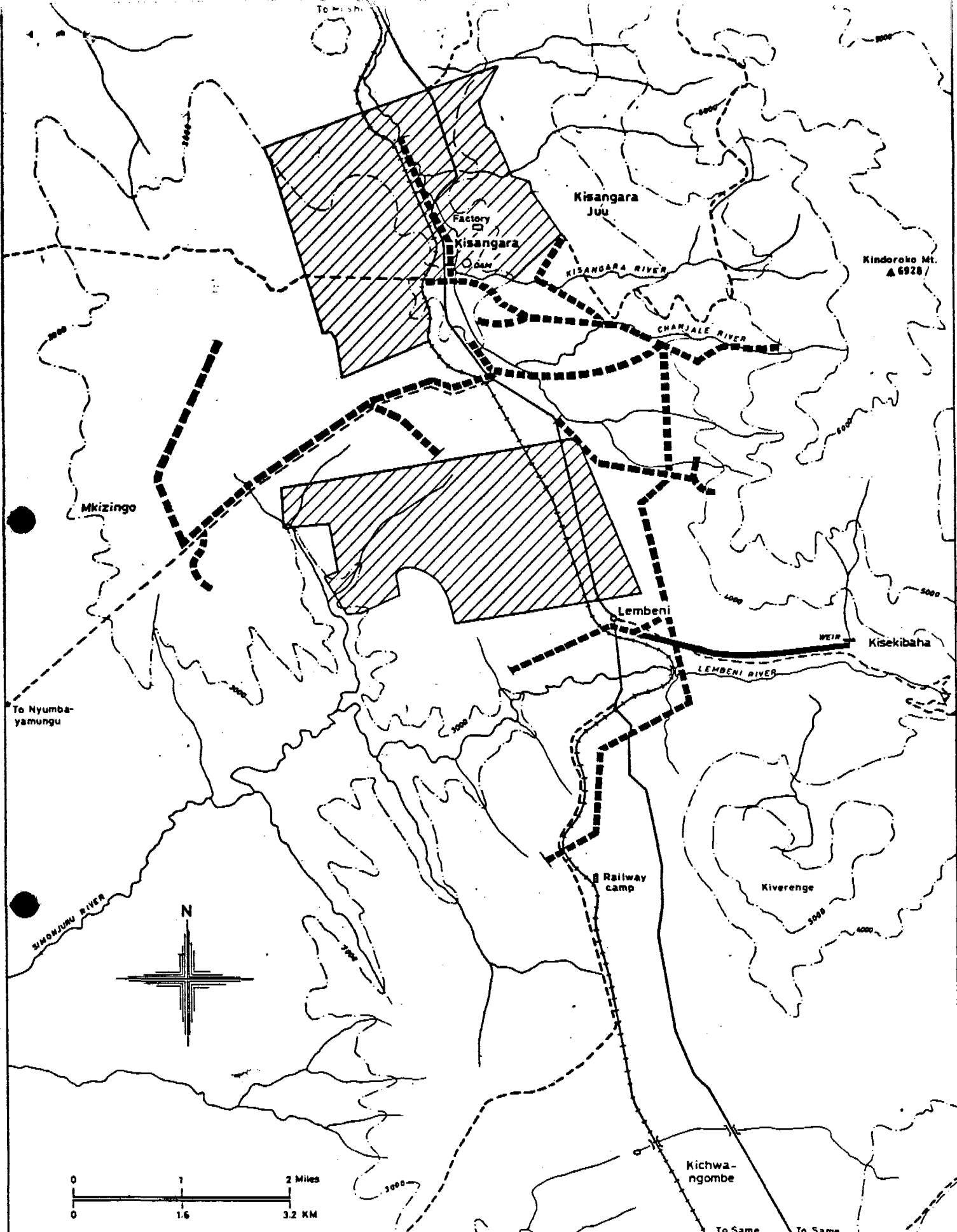
8. GENERAL IDEAS ABOUT WATER SUPPLY

quality
taste
availability

what would they consider an improvement
do they use more or less than others in the village

9. GENERAL BACKGROUND INFORMATION

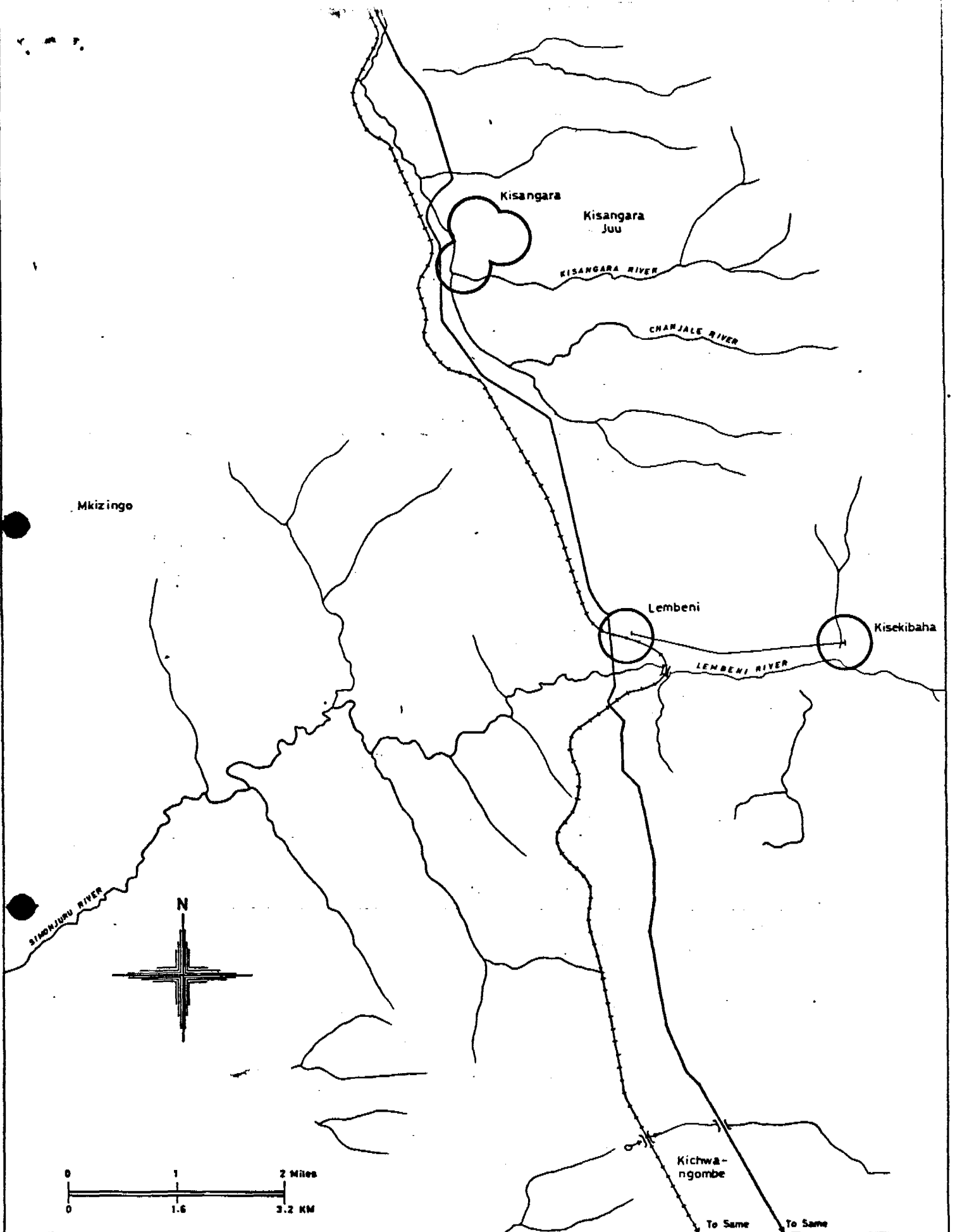
other employment
educational background
which area they come from



WATER SUPPLY IN LEMBENI WARD

MAP 1

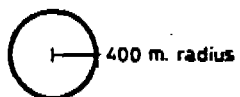
- LEGEND**
- Existing Chanjale pipe line
 - Existing Kisekibaha pipe line
 - Railway
 - Sisal estate
 - Trunk road
 - Other local roads
 - Elevation above sea level in feet



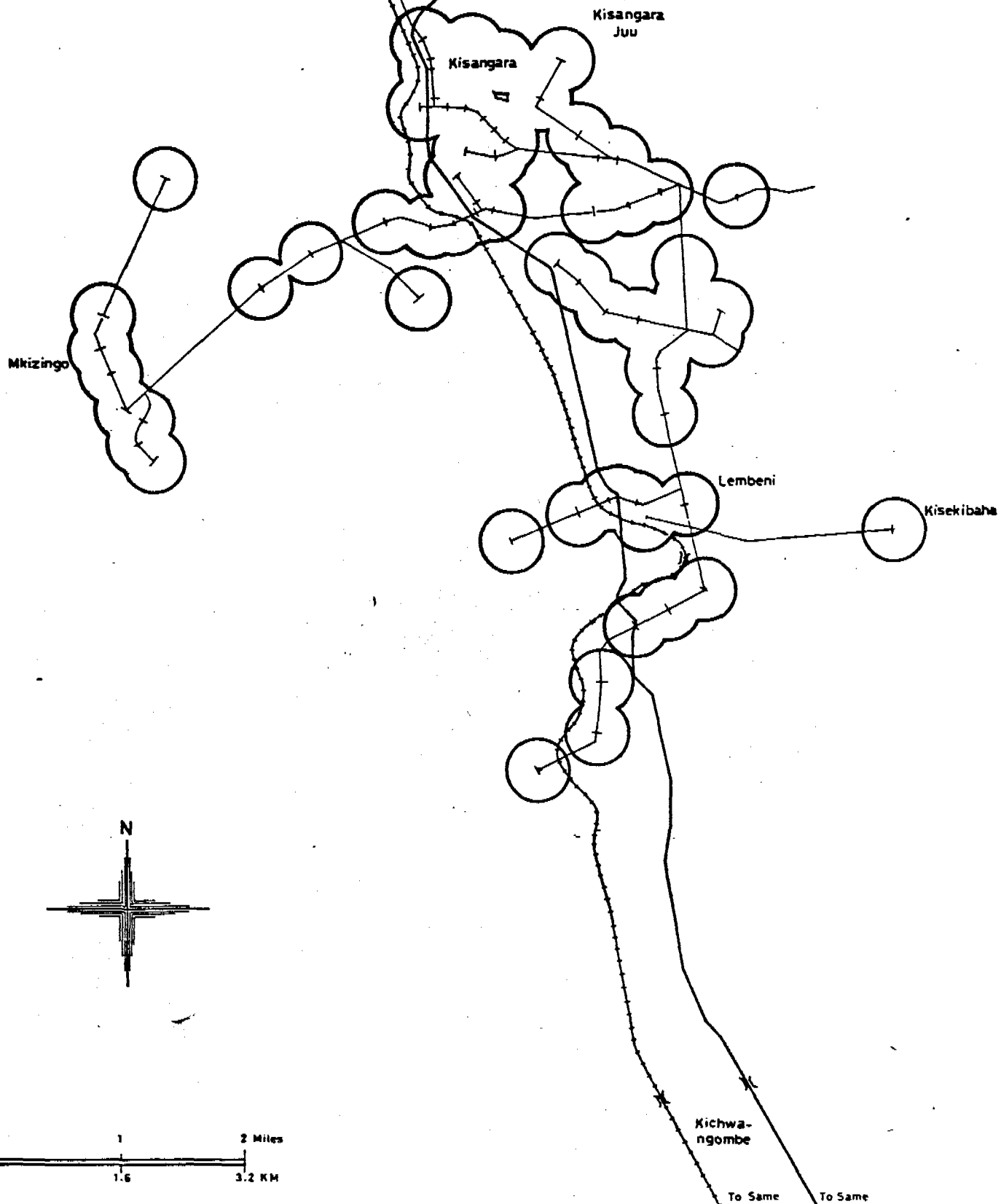
WATER SUPPLY IN LEMBENI WARD

MAP 2

ACCESSABILITY OF DOMESTIC WATER IN LEMBENI WARD BEFORE 1973



People living within 400 m from public water point are considered to have a reasonable access to water according to Tanzanian standards



WATER SUPPLY IN LEMBENI WARD

MAP 3

ACCESSABILITY OF DOMESTIC WATER IN LEMBENI WARD AFTER 1973

