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EFFECTS OF FINNISH DEVELOPMENT COOPERATION ON TANZANIAN WOMEN

WOMEN AND WATER TECHNOLOGY

The Case of the Finnish Water Project in Tanzania

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Research Design

In this study the purpose has been to look at the Finnish Project for Rural Water Supply in Tanzania from the woman's point of view. As the most important target group of the Water Project the women have first hand information about the success or failure of the project.

During the preparatory phase of the study, 1.3.-30.5.1983, data about the planning and implementation of the Water Project was collected and questions concerning women, water and development were studied. Studies in the Swahili language were also an important part of the preparation. The field work period in Mtwara and Lindi Regions started in the beginning of June in 1983 and terminated in the beginning of December in the same year. The report was given to the Institute of Development Studies on the first of March, 1984.

The objective of the research was to study the effects of the Finnish Water Project in Tanzania on the living conditions of the women and the women's participation in the organization and maintenance of the new water system. The central questions have been the following

1) How has the Finnish Water Project been carried out in the villages and what was the woman's role in it?
2) What kind of changes was the Water Project bringing to the lives of the women and what were the women's own views and attitudes towards them?
3) How have the women participated in the training programmes and in the implementation of the project and what are the women's opportunities to benefit from the project?

During the field work participant observation in the villages and interviews and discussions with the women were the main methods in order to find out the woman's point of view towards the project. In the process of communication the counterparts had a significant role. I had during this study two Tanzanian counterpartis who both worked two months with me. Observations about the water-use and village life in general were made and Dispensaries, Health Centres and schools were visited. The Project

Officers and Tanzanian authorities were interviewed as well, and the training programmes of the water project were followed. Project reports and documents and previous studies have been used as a background.

Main conclusions

1. The construction of the wells and water-works has been significant but more emphasis needs to be laid on human factors, on existing institutions and local conditions and needs. Women's participation in the planning and implementation of the project has been very low. The only involvement of women has been in providing free unskilled labour e.g. in trench digging. The community development component in the project was at first almost non-existent. More recently it has been incorporated in the project as contribution of free work by the villagers for the project and by organizing one village meeting in the villages before the construction of the wells. According to the experience gained in this study, it is not enough in order to promote selfreliant action in the villages. The added training component has increased the possibility for more attention given to women.

2. The piped water systems supply people with safe water but the supply is dependent on the availability of fuel which varies. The time women use for fetching water has been reduced in many cases. Drying of ring wells and salty water have caused problems in some areas. If there are not enough wells the women easily continue to use other water sources which are easier at hand. Access to contaminated water sources makes the real benefit of the wells questionable. The women did not always see any difference in the quality of the water in traditional and new wells. Health education seems to be necessary in order to gain profit from the water supply. At the end of this study the health education was still at the planning stage.

3. The proportion of women in the training has been minimal. Only cleaning of the surroundings of the wells has been considered a woman's job. Until the end of the field work only one woman had been trained as a pump attendant and no women had been trained as foremen or water technicians. In general, the Finns feel that they have to keep the control of the project in their hands and responsibility is not given to the Tanzanians and specially not to the Tanzanian women.

Recommendations

On the basis of this study an attempt is made to draw attention to some practical issues which require special care in providing people with water.

It is suggested

1) in the case of information and participation of the villagers:
- that the villagers are consulted early enough about the needs and plans for the improvements of the water supply, their costs and possible alternatives.
- that standards for self-help and participation are set with the representatives from the villages and that the village governments are assisted in motivating and organizing the labour in the villages.
- that the situation of the wells is carefully discussed with the villagers, especially with the women thus avoiding unrealistic expectations.
- that the villagers could get more wells than what has been planned if they are ready to work for them.

2) in the case of water-committees and further water-related development:
- that the water committees are organized following the regular administrative procedures, the tasks of the committees are defined before the construction takes place and that at least two women are members in the committees.
- that the committees get appropriate material for hygiene and health education (e.g. posters) and at least a rudimental understanding of the technical working of the water system.
- that understanding is promoted as to how water-related diseases are transmitted and how the villagers could take action to prevent or block such transmissions, the Divisional Education Officer and the personnel of the Health Centres and Dispensaries could be cooperated with in health ecucation.
- that the people are advised to use the new water points for drinking water, in spite of the availability of other sources.
- that additional facilities for washing of clothes, child washing and bathing are discussed with the women and the construction of them is promoted with the villagers' participation.
- that the existing women's organizations are encouraged to take an

active role in gardening and productive uses of water when water is available in quantity.

3) in the case of training and maintenance of the wells·
- that women are involved in the maintenance and management of the wells and that the training is given at the village level.
- that as many people as possible in the villages get theoretical and practical knowledge of the functioning of the wells. education could be given in school classes and adult education groups.
- that the role of the existing organizations (AFYA, ELIMU, MAJI etc.) is further clarified in the project and specific procedures are agreed on with them about the continuing water use, maintenance and health education.
- that more women, especially Tanzanian women, are employed on different levels of the project, particularly to assist in communication with the village women.
- that the women are clearly kept in mind when developing village water sources and that separate resources are allocated for the training of women.

Concerning the Finns, it is suggested, that attention is paid to the following issues

- that more preparatory and on-the-job training is given to Finnish experts about the Tanzanian administrative and political system and social practice and that more understanding of the historical background of the project area and its people would be included in such training.
- that periodical evaluations of the benefits of the water project are carried out in the villages and that experience is exchanged with representatives of other water projects.
- that the Finnish Experts would get Tanzanian counter-parts and more responsibilty is given to the Tanzanians little by little.

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PREFACE

In the end of 1982 the Finnish International Development Agency (FINNIDA) of the Ministry for Foreign Affairs of Finland invited the Institute of Development Studies, University of Helsinki, to conduct a research project on 'Effects of Finnish Development Cooperation on the Lives of Tanzanian Women'. The research was commenced 1.3.1983 and the active research period lasted one year. Six study reports and a concluding report comprise the total output. The individual study-topics are listed on the inside cover of each report.

The researchers wish to thank FINNIDA, especially Ms. Ritva Jolkkonen and Dr. Elina Visuri for their cooperation, the former at the time of making the preparations, the latter while the research and the report writing were going on. Our gratitude is also directed to the Tanzanian Ministry of Health personnel, especially at the Centre for Educational Development for Health in Arusha (CEDHA). We also direct our thanks to the Ministry of Information and Culture of Tanzania for their part in facilitating the field work. Special thanks go to the the Tanzanian research counterparts and assistants without whom the field work would not have been possible.

Each researcher has further specified those individuals and institutions they owe a special debt of gratitude in their own reports. The authors and the Institute of Development Studies alone are responsible for the views expressed and the interpretations made in the reports.

This project has only been a beginning in the women in development inquiry, and it is the hope of the participants in this research project that their work would be continued in cooperation with researchers from developing countries.

I. BACKGROUND FOR THE STUDY: WOMEN, WATER AND DEVELOPMENT

I. WOMEN AND WATER

I.1. Women, Water and Health

The International Woman's Decade 1975-1985 has been followed by the International Drinking Water and Sanitation Decade 1981-1990. The goal of the Decade is to improve the water and sanitation services provided for the population of the developing countries. Improved community water supply and sanitation is expected to have a wide-ranging health, economic, social and environmental impact on the lives of people (Kia, 1981 a, 1).

The consequences of inadequate supply of water are evident for human life. effects on health, high rates of child mortality and losses of human production. However, these effects hit women most severely. Health problems affect rural women in many special ways, as they, as mothers and caretakers, have to carry the primary responsibility for the health of the members of their families, and because they must use and be in constant contact with contaminated water for various household purposes, including washing, preparing food, and bathing children (Falkenmark 1982, 43).

In poor families, women provide first-line, and often the only, health care. Much depends on their ability to recognize and deal with health problems before they become acute. Women have to be willing to use the health services that may be available, and be able to take the time for it and afford the transportation costs involved. Women are also responsible for inculcating good habits of hygiene and sanitation, which may be as important for health as good food and good dietary habits (Jorgensen 1980, 21).

According to the World Health Organization (WHO), approximately 80 per cent of all sickness and disease can be attributed to inadequate water and sanitation. For example.

- Diarrhoea is the direct cause for death of six million children in the developing countries every year, and contributes to the death of up to 18 million people.
- Trachoma affects 500 million people at any given time, often causing blindness.
- Parasitic worms infect one half of the entire population of the developing countries, often with very serious consequences. For example 200 million people in 70 countries suffer the debilitating effects of schistosomiasis.
- Malaria yearly kills one million children below the age of two in Africa, south of Sahara, alone (Decade Dossier, 16).

Categories of infectious diseases related to water: **(Appendix 1., page 79.)**

The most evident direct benefit from safe water supply and adequate sanitation is the improvement of health. Improved health, in turn, can reduce labour absenteeism, enhance the ability to produce and learn, change attitudes towards family planning, increase life expectancy, decrease mortality, and lower the costs of health care. Furthermore, WHO has documented that potable water supply systems help retard the spread of epidemic diseases, such as cholera and typhoid. People served with potable water are less likely to catch such diseases and of passing them on to others (Kia 1981, a, 3).

The provision of safe water supply means quantity as well as quality. Very low per capita consumption levels do not constitute a safe domestic water supply even if the water is free of contamination. In a number of countries studied, it has been noted that diarrhoeal diseases were primarily reduced as a result of the availability of water rather than the quality of water. The average daily minimum of water for drinking and basic hygiene, is estimated at 30 litres per person (ibid.).

The hypothesized linkage between water quality and quantity and disease rates has been the subject of theoretical discussion and empirical analysis in numerous studies. Most of them conclude that the relationship between safe and convenient water supply and public health is not

that simple (Hannan-Andersson 1982, 21). Improved water supply is a necessary condition for the improvement of health, but it alone does not suffice. Health is also affected by numerous environmental, social and cultural factors (Sounders and Warford 1976/Ibid., 21).

Annex 1. Relationship between water supply improvements and potential benefits.

1.2. Women, Water and Production

It has been anticipated that improved water supply will have a positive effect on the development process in all the various sectors of village economy and society. With regard to women it is often expected that release from the burden of carrying water from long distances will lead to participation in other "productive" activities and that this will have a catalytic impact on women's development (Hannan-Andersson 1982, 35). According to UN (L 15), the water projects should "modernize" the women's role in rural water supply preserving the importance of their contribution while reducing hardship (Falkenmark 1982, 48).

Opposing opinions have also been expressed. Carrying water may not always be a burden for a woman, *it can also be a social opportunity* to congregate, a form of non-material activity which women enjoy and consider important and valuable (Karl and Mathinson 1980; Hannan-Andersson 1982, 37).

Altering the traditional customs may have unexpected chain reactions and disturb the balance of social life at the risk of women. Negative effects on women observed elsewhere because of changed work patterns include. increased work load, loss of independent resources, including access to basic factors of production such as land and labour; loss of autonomy, increased authority over women put into the hands of men, forced dependence on access to cash income since improvement in one area affecting women's labour can often only be achieved if they have more money, and the admittance of women into non-agricultural fields of employment is effected on poorer terms than for men (Monitoring WID activities, 8).

Altering the woman's role in African economies has already happened in colonial times. In stressing cash crop farming at the cost of subsistence Europeans introduced technology into what they defined as the male agricultural sector (Hannan-Andersson 1982, 7). As a result of the fact that the female contribution to the rural economy has been seriously undersestimated, a myth of female dependency has been invented (Germain 1976; ibid., 9). Efforts to increase labour productivity, formal school education and vocational agricultural training have largely been oriented to men. Cooperative societies have been structured on the basis of male heads of nuclear families. In Tanzania, this pattern of operating through household heads has been perpetuated today through village governments which control the marketing of cash subsistence crops (Bryceson & Mbilinyi, 1979; Jipemoyo 2, 1980, 101-102).

In recent times international capital has increasingly and more seriously been invested in the mobilisation of women. Assistance programmes, including water projects, often emphasize "female labour productivity", or rendering women more "productive" by providing them with other kinds of technology. Neither the labour women expend in social reproduction, nor biological reproduction, care of children, the ill, and the elderly nor other kinds of women's time-consuming, energy draining survival work are defined as productive. Of the many components of women's labour and wide-reaching productive patterns principally only one is considered productive in assistance projects: labour expended in the cultivation of cash crops or in other directly income-generating activities. Even food production is often secodary, also where food supplies are insufficient.

A number of recent studies document the fact that women's work in Third World countries is already highly productive and that the women are often overworked. Assistance efforts should aim at reducing their workload. Women should not be burdened with expectation of increased production, unless there is substantial improvement in available techniques and training. Water projects should aim at general embetterment of living conditions and people's health and be expected to have only indirect effect on production.

2. WOMEN IN DEVELOPMENT

2.1. Women in Technological Development

The consequences of technology on the formal and informal sectors of society and on the division of labour are far-reaching. Usually the technique spreads more quickly than cultural impulses (Raumolin, 1983). The need to study technology in respect to women arises from the fact that women's tasks and needs have often been neglected in technology projects. The projects have not assisted women in their contribution to community and national development.
Adapting to new conditions is more difficult for women than for men because family obligations make them less mobile, their choice of occupations is more limited by custom, they usually have less education and training and they face discrimination in the labour market (Boserup 1977). In development programmes related to water, the men have usually been given control over the new technologies introduced. With very few exceptions only men have been trained for the maintenance of the new system (Jørgensen 1982, 7). Women have also only rarely been involved in any decision-making on water (Wijk-Sijbesma 1983, 14).

The technology always affects the people who are using it in some way. When initiating a rural water project in an area, not only new techniques are introduced, but also new concepts of the relation of water to health and diseases and new ways of organizing community (Whyte 1976; Hannan-Andersson 1982, 23). Technology can be studied in its effects on an individual and on the social group to which she belongs, analyzing the forms of control, authority and power exercised over them (Swantz 1983a, 6).

If there are difficulties in applying the technology, technical experts tend to consider the problems as being purely technical by nature, through improved hardware devices they can be solved. Experience has shown, however, that the difficulties are institutional as well as technical, and that the tendency of separating these two aspects contribute to failure in technological projects. Lately besides hardware

technology attention has been paid to software technology. It means that appropriate technology and efficiency in implementation are not enough; more emphasis needs to be laid on human factors, on existing institutions and local conditions and needs.

When the attention is focussed on the woman, identifying and defining first the needs, resources and skills of rural women would clarify many of the problems faced when technological projects are introduced. Different modes of technology, not least those close to women's every day needs, require their conscious cooperation in creating new practices, new relationships and new forms of thinking.

2.2. Women in Social Development

Women scholars, in raising the problem of women's development in relation to social development, have argued that policies concerning women are frequently perceived as derivative of the broader socio-economic and political strategies for change (Croll 1981, 373). In general, women's entry into the labour force has not meant that they are given a full part in the control of their own labour and in the distribution of the fruits of production. The problem in development process has been that it relegates women, ideologically and in practice, to the "domestic" sector as assumed dependents of men, and overlooks their broader economic roles and potentials (Rogers 1980).

With regard to the water projects those roles that women already play in different activities as organizers, drawers, users, family health educators and motivators would need to be taken into account in the planning and implementation of the water projects. In general, women have been viewed as passive or neutral factors in the socio-economic and technological transformation being implemented in rural areas (Swantz 1977). Yet, from the woman's point of view it is crucial whether women's participation is necessary and possible in the process which concerns their own development.

Development in this context refers to improvement of people's living conditions through a process which the people themselves can influence

and make decisions about. Development is thus people's own development, not only improvements and decisions made by others on their behalf, and inputs brought to them from the outside (Swantz 1983, 2). This is in line with the Tanzanian policy about development as 'development of people not of things'.

> "Any action that gives (the people) more control of their own affairs is an action of development, even if it does not offer them better health or more bread. Any action that reduces their share on determining their own affairs or running their own lives is not development and retards them even if the action brings them a little better health and a little more bread... If development is to benefit the people, the people must participate in considering, planning and implementing their development plans." (T.A.N.U. Guidelines, 1971, 9).

3. WOMEN IN TANZANIAN SOCIETY

3.1. Women in Production

In Tanzania, women are the main agricultural labour force. Over 90 per cent of the female population live in the rural areas. They produce most of the food crops for survival and, in addition, for sale both onthe local and external market for cash income. The women have the responsibility for the tasks of hoeing, planting, weeding and harvesting. The men often do the clearing of the land and control the use of the land (Swantz 1983, 236; Hannan-Andersson 1982, 12-13).

According to Swantz, nothing has affected the woman's position as negatively as the fact that men became part of the money economy, while women continued in the traditional sector. With their sense of duty towards home women have offered free labour while men have placed themselves under freer modern norms. The fact that women continued in the traditional sector meant that their labour was not counted in money except when the bridewealth began to change from a token symbol of work contributed to the parents-in-law's fields to payment of money. The woman's value was then set in cash together with the symbolic gifts. This was the beginning of the division of

public life as men's sector and private life as woman's sector. It also enabled the manipulation of cultural values to the advantage of men (Swantz 1982a, 67-68).

3.2. Education of Women

The educational component is very central in Tanzanian policy. Education aims at equipping the learners with knowledge, skills, and attitudes for tackling societal problems and at preparing the young for work in the predominantly agricultural society (Basic Facts About Education in Tanzania 1980).

Education for self-reliance is seen as a tool in building Tanzanian socialism. The goal is to train people to think for themselves, to make judgements on all the issues affecting them; to be able to interpret the decisions made through the democratic institutions of the society, and to implement them in the light of the local circumstances (Education in Tanzania after the Arusha Declaration 1967, 15).

Adult education is seen as a broad area of learning activities with emphasis on the arousal or awakening of adults' awareness of their realities and their abilities to change these realities (Hall 1975, 67). The large literacy campaigns have followed the principles of functional literacy by stressing social and political education.

In the formal sector, the Tanzanian educational policy stresses the right of all children to primary education. Under the Universal Primary Education Programme introduced in 1977 all the children of school age should attend Primary School. Women have in principal the same acess to education as men. By 1981, 47 per cent of all Primary School places were occupied by girls but the proportion of girls in the educational system drops with each successive level of education (Mongella 1982, 9; for further statistics on literacy and women's education, cf. Böök's study).

The children's attending school may have a worsening effect on the woman's work load. Traditionally the children have helped women

by providing assistance in household activities. It has been customary for girls to be kept home from school to help with, among other things, carrying water. When children go to school, they are away from home work. Also, when girls receive higher education they do not want to go back to agricultural work any more. At the same time more and more men prefer to move to the cities for wage labour and higher salaries. This leads to the situation that the proportion of people working in agriculture declines, women are left with increased work load while higher amounts of production are needed.

In assessing the effects of a water project, other simultaneous changes in the society thus complicate the situation. Direct effects are hard to estimate. No simple measures can be used.

3.3. Means of Political Participation

According to the Party and Government constitutions women have the right to participate in all the decision making bodies starting from the village level to the national levels. In principle the ways are open to women but in practice there are very few women in the decision-making bodies. The special institutions for women are the following.

1) UWT - The Union for Tanzanian Women
2) Division for Women and Child Development in the Prime Minister's Office
3) The Non-Governmental Organizations, e.g. Family Planning Association of Tanzania (UMATI) and different Religious Institutions (Mongella 1982, 5-12).

These organizations encourage women to participate in social life. At regional and district levels desk officers are subordinate to the Community Development Officers in charge of Women and Child Development. Their work is to give material and organizational support to women's activities. In the Mtwara Region this kind of support to the women's groups was forthcoming in the village belonging to the UNICEF basic service programme.

The UWT has organized women into various cooperative economic ventures which include shops, restaurants, hotels, kiosks, farms, poultry, piggery and small-scale industries. The main problem facing these projects is the shortage of funds which has resulted on most of these enterprises being so small that they are not economically viable. The second problem is lack of know-how required to run them efficiently (Ibid., 6). In evaluating the institutional setting of the water project its relation to women's organizations needs to be considered.

There are practical problems and attitudes which prevent women from independent economic activities as well as from sitting on the decision-making bodies. May be the biggest problem from the woman's point of view is that the funds which women earn through primary productive work are usually controlled by men. In order to get money of their own women should do some additional work. Yet the women's cooperative groups have often been successful. Women have indicated basic willingness and capacity for working together for common good (cf. Swantz 1983, 174,240).

II. WOMEN AND THE MTWARA-LINDI WATER PROJECT

I. THE MTWARA-LINDI WATER PROJECT

1.1. Description of the Mtwara-Lindi Water Project

The Rural Water Resources Inventory and Development Planning Project·

The background for the Mtwara-Lindi Water Project was the aim of Tanzanian government to provide the entire rural population with easy access to a dependable source of drinking water by the year 1991. On October 4, 1972 an agreement was signed between Tanzania and Finland on the Inventory and Development of Water Resources in Mtwara and Lindi Regions. (A. Toivola 1983, 78-79).

During 1973-76 the Rural Water Resources Inventory and Development Planning Project was carried out by the Finnish joint venture Finnwater in the Mtwara and Lindi Regions. The objective of the project was to produce a Water Master Plan, which would provide information about water resources in the area and from the basis for future planning (A. Toivola 1983, 79). At the same time the Finnconsult Engineers and Finnplanco Ltd produced Integrated Regional Development Plan for the regions for the years 1975/76-1979/80. Later on the Water Supply Construction Project was the only part of the Regional Integrated Development Plan which got funds from Finland.

Village interviews by Finnwater during the Rural Water Resources Inventory and Development Planning Project:

Due to the villagisation process in 1974-75 a considerable change occurred in rural settlement. Because of this a village interview was organized by Finnwater during the time of Water Master Plan. The purpose of the interview was to investigate the new pattern and distribution of population and to clarify essential factors as concerns water supply (WMP, G, 13).

According to the Water Master Plan the following facts were collected:

name and location of the village, the amount of population and livestock, the type of the present water source and its distance from the village and an estimate of the quality and suficiency of the water source. The possible existence of a school health centre or dispensary was also investigated (Ibid.).

In the village either the village chairman, the village secretary, a member of the village committee or the head teacher was contacted, when possible. The final estimate of the distance of the water-source was made by the interpreter when several estimates were given by the interviewed persons. If the time used for the distance was given, this was converted into miles by using the ratio 1 mile in a quarter of an hour (Ibid., 14).

According to the Finnish staff nearly all the villages were visited. The number of ujamaa (cooperative) villages amounted to 359 in the Mtwara Region and 279 in the Lindi Region. The information gathered with the interviews was limited to few basic facts estimated by some person in a leading position in the village. The Finns worked together with Tanzanian counterparts who served as interpreters (J. Manninen). There are no remarks in the reports suggesting that any women had been interviewed. It does not seem either that the formal village government structure would have been utilized.

The Water Supply Construction Project:

During the Water Supply Construction Project wells, pipes and water works have been constructed. The first phase of implementation took place form January 1978 to March 1980. During that period 556 shallow wells with hand pumps and eight piped water supply systems were constructed. All in all these serve about 240.000 people. Phase II started immediately after Phase I in april 1980 and continued to the end of December 1981. During that period 613 shallow wells with hand pumps serving about 120.000 people were constructed. Also a construction of seven new piped water supply systems were started during Phase III, they will serve about 300.000 people. The biggest one is the Kitangari Scheme, which will serve 100 villages on the Makonde Plateau in Newala, having a designated capacity of 7200 m^3/day (Phase II, Final Report, 1).

The construction of the piped water supply systems has been smaller than what was planned. Shallow wells have proved to be a cheaper and more reliable water source than a piped system. Many of the constructed water-works have been out of use 30-50 % of the time due to shortage of fuel and for shorter times because of mechanical breakdowns (Ibid., 35,37 and M. Rantala).

Maintenance of the wells·

By the end of the year 1983 about 1500 wells had been constructed. The condition of the wells has been checked every third month by the well maintenance team (Shallow well construction areas, Annex 6).

According to the Progress Reports the condition of the wells has been the following·

	visited wells	repaired pumps	%	water situation % enough	not enough	dry
1.7.-30.9.1982	1310	324	25	48	30	22
1.10.-31.12.1982	1124	263	23	39	43	18
1.1.-31.1.1983	1180	255	22	83	14	3
1.4.-30.6.1983	1147	186	18	87	12	1
1.7.-30.9.1983	1049	241	23	69	20	1

The more difficult the water situation has been the more often the pump has been broken. Most common defects have been the cylinder and the handle. The bacteriological condition of the wells has not been investigated.

The pump of the shallow wells is the Finnish made Nira-pump. The construction of the Nira-pump has been changed six times during the implementation of the project. The newer models are somewhat more durable than the older ones. The spare part costs for a well over 34 USD/year last year, which is quite high in comparison to the World Bank criterium of 5-7 USD/year (M. Iikkanen).

1.2. The Water Policy of Tanzania in Relation to General Policy

The Tanzanian water policy is closely connected with the villagisation operation which was carried out in Mtwara and Lindi Regions in 1974 and 1975. Large numbers of people were moved, sometimes under duress, from scattered settlements into villages. The aims of the operations were on the one hand to help improve welfare services and political communication by concentrating the population, and on the other hand to give an initial push to the formation of producer co-operatives incorporating all rural producers (Hasset 1982, 2).

With the concentration of people in villages the need for adequate water supply became crucial. The Tanzanian Government had set the following long-term objective of the water-supply development: every Tanzanian should have access to a public domestic point at an average distance of 400 meters, and the quantity of 30 litres of water per person per day. In 1975 this was followed up with a crash programme providing that every village should have a reliable water source by the year 1981 (WMP; Main Report, 13).

The Tanzanian Government has received substantial financial and technical assistance for the water programme from international and bilateral agencies. The different agencies, divided to provide water in different regions, have implemented the programmes independently of each other. The linkage between the agencies and the Ministry of Water has been the Regional and District Water Engineer (Appendix 2., page 80).

The connections between the water administration and general administration are few, which may have caused some problems in the implementation of the water programmes. The general administrative structure operates on five levels: the Region, District, Division, Ward and Village but the Ministry of Water has representatives only down to the District level.

Each level of the administrative structure is reflected in the organization of the party (CCM). In theory, planning occurs through a "bottom up" approach with development proposals being progressively worked

up and aggregated from the village level. In practice, the inherent difficulties of operating such a system, the lack of trained administrative staff below district level, resource constraints and the exigencies of national policy and decision making means that most planning occurs at district and regional level (RIDEP/Lindi 1981-1986, 5). The village leaders may become a conduit for party and government exhortation to higher prodution and harder work, and in this sense they may be seen as the bottom rank of the administration rather than as representative of the village (White 1981, 24). In regard to the water projects, the villagers may look at them as government's projects (Ibid., 33).

The regional and district administrations are headed by a Regional or Area Commissioner, who is a politician and also Regional or District Party Secretary. Responsibility for carrying out different development programmes rests with Regional Development Director (RDD). At the District level the District Executive Director (DED) is responsible for obtaining the participation and commitment of villagers and for ensuring that government staff work closely with the people in preparing and executing the programmes.

1.3. Economics of Water

According to the Tanzanian policy the entire rural population in Tanzania should have easy access to a dependable source of drinking water by the year 1991 free of charge. The government has so far received substantial financial and technical assistance for the programme as about 85 per cent of the rural water supply development programme is being supported from external sources (Daily News 2.6.1983).

The Finnwater project gets most of its funds from Finland through FINNIDA. The financial implications during 1972-82 were 56,3 million Finnish marks, which accounts for 12 % of total Finnish aid to Tanzania during the same period (Toivola 1983, 78). The British Government has supported the project by supplying equipment and materials. UNICEF has supported the project by supplying materials and some equipment for the Kitangari Project. (M. Rantala)

Tanzania has paid 10 to 12 per cent of the total costs. About 95 per

cent of them have been local salaries, the rest being some office expenses such as telex and telephone outlays. These funds have been channeled through the Regional Water Engineer. When local funds have not been available these costs have temporarily been paid by FINNIDA (Ibid.).

According to the Water Master Plan the water development costs during the five year period 1976-81 were estimated to make a total of 53.4 million shillings in the Mtwara Region and 27.5 million shillings in the Lindi Region. During the five-year -period of 1981-1986 the development costs have been estimated to be 64.4 million shillings in the Mtwara Region and 29.8 million shillings in the Lindi Region (WMP, Main Report, 64, 110).

According to M. Rantala the development costs have been lower than what was estimated. This is mainly due to the fact that as many piped water supply systems have not been constructed as have been planned. Big pumping stations are more economic than smaller ones. They have also more political weight, which is important for the maintenance of the system (M. Rantala).

Operation and maintenance costs are increasing every year due to the new annual completion of systems. According to the Water Master Plan these costs have been estimated to grow from 26.6 million shillings in 1976-81 to 83.0 million shillings in 1986-91 (Mtwara and Lindi Regions together) (WMP, Main Report, 64, 110). These costs will have to be carried by Tanzania after the project has been completed and handed over to the local authorities. How the costs will be covered is causing considerable headache at present. What is gained with an easier access to water will eventually have to be payed for either directly or indirectly with productive work.

The problem is where to get the money for operating and maintaining the rural water systems? Higher quality standards also mean higher costs. The level of service is principally determined by the funds available to the government and the health and income status of the communities concerned (Kia 1981 b, 2). What happens to the project when it is handed over to the Tanzanian Government? The costs of fuel, spare parts, vehicles, and other items required to keep the system operating as well as labour required for maintenance will have to be carried by the same people who first benefit from the project.

This concerns mainly women through whose voluntary work already now large part of required digging is done. Through their productive labour they will eventually have to earn the cash needed for keeping the system running since the only solution seems to be that the funds are in one way or another taken from the users, contrary to the policy so far. But in order to be willing - or able - to pay for the water the benefits from the improved supply should be tangible. Otherwise the water supply is considered a new burden not worth shouldering (Dworkin 1981, 10-11).

There are some problems in getting communities to pay for systems that are seen as Government choices rather than individual choices. When the systems are built by the Government, people naturally believe that the Government should pay for the operation. But if individuals are asked to pay for the system, they should be involved in the water supply decision making as well. The community should at least be aware of what will be done and should help to develop the rate structure. Whenever possible they should also be involved in choosing technologies and should be aware of the costs of the technology they choose (Ibid., 11). Since this has not been the case with the Finnwater project difficulties can be anticipated on this score.

During the Second Ordinary Party Conference, October 20th, 1982, President Nyerere in his function as the Chairman of the National Party CCM made the following statement regarding rural technologies:

> "Whatever the technology used, it must be adopted in consultation with the local people and from the beginning the responsibility for looking after the facilities must clearly be theirs. Government cannot finance the maintenance and repair work of basic village equipment if new developments are to go ahead." (Project for the Development of a Community Participation Component in the Tanzanian Rural Water Supply Programme 1983, 42).

1.4. The Mtwara-Lindi Regions' General Description

The following information about the Mtwara and Lindi Regions is based on The Regional Integrated Development Plans 1981-86 (RIDEP), the Water Master Plan (WMP) and the Population Censuses 1967 and 1978.

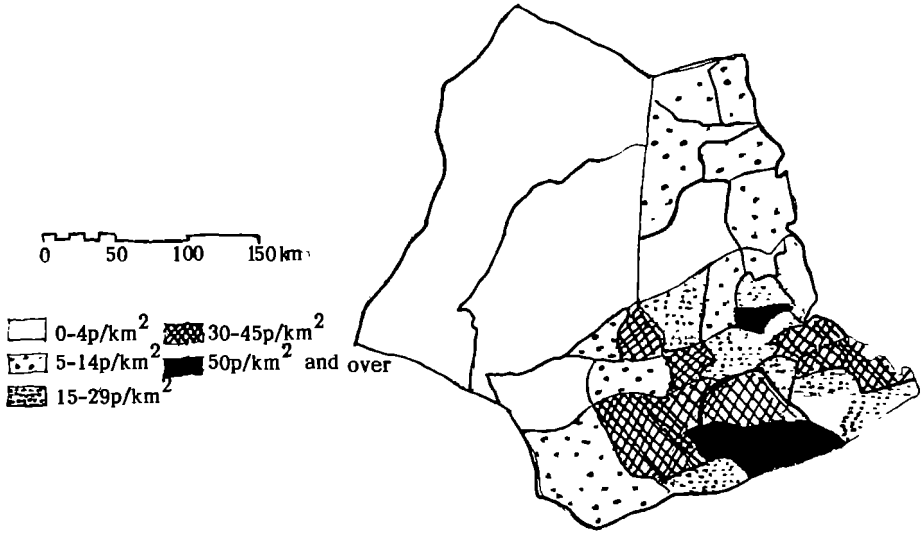
Population:

In the year 1978 the population in the Mtwara Region was 771,818 in an area of 16,707 km^2. In the Lindi Region the population was 517,624 in an area of 66,046 km^2 (Annex 2).

The Mtwara Region is considerably more densely populated (46 p/km^2) than what is average for the country. The whole of the Newala District (77 p/km^2) and the surroundings of Mtwara town are especially densely populated areas. Contrary to that the Lindi Region is very sparcely populated (8p/km^2), especially the Liwale (1 p/km^2) and Kilwa Districts.

The population of the Mtwara Region has increased at an annual rate of 2.0 % since previous census in 1967. The reasons for the relatively low growth rate (compared to the national average 3.3 %) in the inter-censal period seem to have been both political and economic: the return of the refugees from Mozambique back home and emigration of natives from the region due to the economic slow-down (RIDEP/Mtwara 1981-1986).

In the Lindi Region the average annual growth has been 2.1 %. The slow population increase in the Lindi Region can be attributed to relatively low fertility and high mortality rates as well as emigration to other parts of Tanzania (RIDEP/Lindi 1981-1986, 3).



Population density in the Mtwara and Lindi Regions. Source Finnwater

Rural production:

The economy of the regions is based on agriculture. Important crops are cassava, sorghum, rice, maize and groundnut. The cashew nut is the most important cash crop. The contribution of the Mtwara Region to the total national cashew nut production has been about 50 %, half of which has been produced in the Newala District. In 1979/80 the production had fallen to only about 25 % of the level of 1973/74 but on the season 1980/81 the production was again almost double the 1979/80 tonnage. The relative level of the price of cashew has followed the same trend (WMP, G, 22 and RIDEP/Mtwara 1981-1986, 12, 16).

Livestock production is small in both regions, in the Lindi Region especially due to the tse-tse fly. In the Mtwara Region 60 % of the livestock is in the Masasi District. In 1983, 80 % of the livestock was individually owned and 20 % was owned by Ujamaa villages. Goats are most suited to local conditions since they are very disease-resistant.

The increase in the cattle, goat and sheep population is estimated to be less than 20 % since 1972 (C. Mapunda and RIDEP/Mtwara 1981-1986, 13, 14).

Percentage of families keeping cattle, sheep or goats in each District

District	Cattle	Sheep	Goats
Mtwara	0.2	1.5	5.7
Newala	0.02	0.7	13.6
Masasi	2.2	1.3	1.0
Mtwara Region	0.9	1.0	8.0
Lindi	0.4	0.8	2.0
Kilwa	0.3	0.9	0.7
Nachingwea	0.2	0.3	0.8
Liwale	0	0	0.3
Lindi Region	0.4	0.7	1.4

Calculations based on
1. 1978 Livestock Census preliminary results, privately owned animals only
2. 1978 human population estimated from 1973 Census and average growth rates between 1967 and 1973
3. Assumed average family size = 5
4. Assumed average herd and flock size = 5

Source: Mtwara/Lindi Regional Integrated Development Programme. 1979 Vol.2.,34.

Industry·

There was no major industrial base in the Mtwara Region till the mid-seventies. Industrial developments have consisted of the construction of four cashew processing plants and a soft drink bottling facility. The bottling plant, though completed, remains idle e.g. because of lack of sufficient water of suitable quality (RIDEP/Mtwara 1981-1986, 22).

Lindi is one of the least industrialized regions in Tanzania. The most common enterprises are carpentry, vehicle repair, building and milling. At Lindi, Mtama and Nashingwea, cashew nut processing factories have been built, at Nachingwea an oil-seed mill and at Kilwa a saw mill were started. The Small Industries Development Organization (SIDO) has constructed a small industrial estate at Lindi Town consisting of 11 serviced factory units (RIDEP/Lindi 1981-1986, 45, 46).

The main reasons for the slow pace of industrialization are shortage or lack of power and water in the main towns, the poor roads and transport infrastructure (RIDEP/Mtwara 1981-1986, 22). The Finnwater project does not cover municipalities. In some villages people have small-scale home-industry. Men do carpentry and the Makonde-carvers have their workshops. Women plate mats and do pottery. The pottery enterprises are dependent on suitable water; prevalent saline water cannot be used for making pots.

Health:

The health facilities are operated by the government, churches, para-statals, and Government institutions such as prisons and colleges. National policy is to avoid overlapping services and the Regional Medical Officer is responsible for ensuring coordination between the different agencies. Four levels of health facilities operate in the regions. village health posts, dispensaries, health centres and hospitals (regional and district hospitals). Dispensaries and health centres operate in rural areas (RIDEP/ Lindi 1981-1986, 65).

The following national targets have been set for the distribution of health services:

i) Village Health posts: one per village without a permanent health facility.
ii) Rural Dispensaries: one per a rural population of 6,000.
iii) Rural Health Centres· one per a rural population of 50,000, existing government hospitals also included.
iv) Hospitals: one hospital bed per 1,000 people.
v) Accessibility: 65 per cent of the rural population should live within 5 km of a permanent health facility (Ibid, 66).

The population is substantially well served with health facilities (Annex 4). Still, the spread of facilities is often uneven and their quality can be poor. It has been most difficult to provide effective health coverage in the remotest and most sparsely populated areas (e.g. the Kilwa District). In Mtwara Region, the Newala District is poorly served in comparison to the Mtwara and Masasi Districts. In Masasi the Ndanda Mission Hospital has a high level of service. The problems of smaller dispensaries include lack of water supply, latrines, lamps and other essential equipment. There is also a shortage of transport and staff (RIDEP/Mtwara and Lindi 1981-1986).

Education:

In 1978 64 % of the male population in the Lindi Region and 65 % of the male poplation in the Mtwara Region were reported literate. Of the female population 34 % in the Lindi Region and 39 % in the Mtwara Region were reported literate. The Mtwara percentages equalled with the Tanzania totals (Annex 5 and 6).

The Region is responsible for primary school education and adult education and the education of the handicapped. Great progress has been made towards Universal Primary Education legislated in 1977 (UPE). In the Lindi Region the number of children attending primary school increased from 42,295 in 1973 to 95,521 in 1980. Over 80 % of children aged between seven and nine years were enrolled for primary school.* In the Mtwara Region more than 143,000 were attending primary school, which is about 90 % of the 7-13 age group. Less than 3,5 % of those having completed primary school go to attend Government secondary school (RIDEP/Mtwara and Lindi 1981-1986).

Adult education is carried out by a small number of full-time teachers plus volunteer primary teachers. Primary schools are used for instruction. Emphasis is put on helping people develop and use their literacy through

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* The population of the Lindi Region is largely Muslim. Hence their literacy would be in Arabic characters and related to religious texts. The religious adherence also explains at least partly the low attendance to registered schools prior to UPE 1977.

courses at folk development colleges, by means of technical training, and by provision of small reading rooms/libraries (RIDEP/Mtwara 1981-1986, 33).

The shortage of deep pit latrines and the inadequacy of water supply in schools constitute a health hazard. Other problems are: shortage of staff, inadequacy of school buildings, shortage of desks and chairs and inadequate supplies of teaching materials, particularly text books. The situation reflects the rapid advance made towards UPE and the strain it has put on limited financial resources (Ibid.).

Ethnic grouping.

Taking the two regions as a whole, the Makonde are the largest ethnic group, followed by the Mwera. The following information, based on Finnconsult (1975) and Finnplanco (1975), is taken from the 1967 census (the 1978 census did not include ethnic grouping).

Ethnic composition in the Mtwara and Lindi Regions

Ethnic group	Mtwara %	Lindi %
Makonde	60	13
Makua	21	-
Yao	9	6
Mwera	1	40
Mawia	1	3
Ngindo	-	12
Matumbi	-	7
Machinga	-	3
Others	8	16

Source: RIDEP, Vol.2, 5.

Religion.

According to the 1967 population census Islam is the main religion in the Mtwara and Lindi Regions. The Mtwara District is nearly completely Muslim but in Masasi and Newala there are quite many Christians also. In parts of the Lindi Region there are also concentrations of Christians but in general they are a minority. The religious influence has been felt especially in attitudes towards women's education.

2. METHODOLOGY OF THE STUDY

2.1. Research Objectives

The objective of the field work was to study the conditions of life of women in relation to the water situation in the villages. How has the Finnish Water Project been carried out in the villages? How have women participated in the planning and implementation of the project? What kind of changes have occurred in women's lives due to the project? By participating in village life and through discussions with women the objective was to find out women's own views and attitudes toward the changes that the water project was bringing to their lives and what were the women's opportunities to benefit from them.

2.2. Field Work Methods

The main methodological solutions were initially guided by the principles of participatory research approach which has been developed in Tanzanian circumstances by e.g. M-L. Swantz. Participatory research stresses the educational aspect of social investigation as central to its conceptualization (Hall 1981, 7). Such a research has an educational component for all parties concerned. It is important that the community population gain not only from the results of the research, but from the process itself (Ibid., 11). For this an ongoing communication is needed. The dialogue to be clear cannot have its premises predetermined (Swantz 1983-b, 17).

In practice the main method in this study was often an interview although attempts towards dialogue were made. The conterparts had a significant role in the process of communication. I worked with two different counterparts, two months with each of them. The first one was Celina Shinyambala who came from Dodoma, Prime Minister's Office. She had a Master's Degree in community Development and was at that moment working in the Division of Women and Child Development in the Prime Minister's Office. She introduced me to the hierarchial system of the administration as well as to the work of functional officers at different levels. She had a special interest in women's co-operative activities and was also willing to give advice in those questions. Unfortunately she did not write a personal report of the study.

The other counterpart was Jessy Nandonde from Mtwara. She had finished Form four at Secondary School and had gained some working experience in a bank and with Finnwater for a short time some years ago. Her main job during the field work was to work as an interpreter, but in the villages she at times had a leading role and facilitated the communication. The were some language problems between us but she was diligent in work and learning and had a personal interest in the study. Afterwards she was employed by Finnwater for village work.

In Kinyope I was concretely given a task by the Finnwater Engineer to have a village meeting there. It helped me to understand the problems of the project personnel but the idea of following the interaction between the project and the village was not realized in that way.

Different formalities were needed before we could go to the villages. From the Region we got a letter addressed to the District Executive Director who wrote separate letters to all those villages which we wanted to visit. In the villages we first got in touch with the Villag Chairman or Secretary. The first contact with women was usually made at a meeting which was summoned by the Village Chairman. Afterwards the discussions were continued individually with those people who showed willingness for it. One or three meetings were held in six different villages. In three of the villages (Mtopwa, Kinyope, Lukuledi) I stayed for a longer time (from five to ten days) with my counterpart. During our stay the village officers were visited and discussions held with the women. Observations were made about water-use and village life in general. Dispensaries and schools were visited. The training programmes of the project were followed as well as village meetings organized before the construction of the wells.

2.3. Difficulties and Limitations

The aims of the participatory research are much more far-reaching than what was possible to achieve in this study. The time was too short for the approach and the discussions stopped too quickly in order to lead to further analyses of the situation. Ideal communication was more often an unattainable goal in the real situation, not least because of the problems due to the language barrier. In spite of a diligent learning effort my Swahili remained inadequate. Misunderstandings and incorrect interpreatations were always possible and all the women were not even fluent in Swahili.

It was not always easy to know what kind of information was obtainable in each situation. Unknown circumstances and practical problems made it sometimes difficult to see those opportunities which were at hand. Further, my role was not clearly defined between the project and the villagers. The role of the researcher was confusing because of many contradictory expectations put on it. People in the villages often felt that I was working for the project. Sometimes it was an advantage, sometimes it made it difficult for me to get appropriate information. Also the villagers often expected me to help them in other problems, especially problems of transport. The fact that I lived with the project training officer in the Finnwater compound contributed to my own view of the situation. My identification with the Finnish side of the project became perhaps unnecessarily close.

2.4. Choice of the Villages for Study

The Mtwara-Lindi Regions together make a large area where the problems of water vary from one part to another. The idea was to select divergent villages based on the following criteria:

a) geographic location in Mtwara-Lindi Regions
b) time of construction of the water supply
c) level of water supply
d) access to alternative water sources

One of the villages was chosen from the Makonde-plateau, where the largest piped water supply system of the project has been built. The Makonde-plateau is known as a waterless area where the distances to the traditional water sources are very long. In this study the central village was Mtopwa in Kitangari Division. The village has been connected to Kitangari water-works in 1982. Significant in the choice was also that Finnwater had hired a house there, where it was possible to stay.

Another area was chosen from the Lindi District where the well construction phase was just going on. The main village there for the purposes of this study was Kinyope in Milola Division. Traditionally there has been enough water in the village because of a river nearby. The problems of water were more qualitative ones.

The third area was situated in the Masasi District, farthest away from Mtwara, where the water situation has been very critical. The area is relatively dry and in most of the wells which have been made, there is not enough water during the dry seasons. In Masasi the Lukuledi Village in the Lisekese Division was chosen for this study. It is the biggest village in the Masasi District with a Catholic mission and a hospital. The alternative watersources are two dams in the village.

In addition to these several villages near the Mtwara-town were visited. In these villages, the main purpose was to follow the training programes of the project as well as different women's activities (Annex 7).

A common type of house in the villages.

3. WOMEN AND THE WATER PROJECT: CASE STUDY IN THREE DIFFERENT AREAS

3.1. Makonde Plateau

3.1.1. Why do Makonde live so far from Water?

The Makonde-plateau is waterless but much more fertile than the lowlands, which surround it. Erosion of the surface has been prevented and fertility preserved by a stump-cultivation and bush-fallowing which was the traditional method of cultivation (Liebenow 1971, 28). The area immediately below the plateau is the most densely populated part of the Masasi District. There are numerous springs at the foot of the plateau from which the whole population of the Makonde-plateau has been fetching water before. As the population has increased, people have started to migrate towards the centre of the plateau farther away from the water supplies (Provincial Commissioner 27.12.51. NA File No. 14/7).

There is a Makonde myth which tells about the relationship of the Makonde and water:

> "In the beginning there was a being, not yet a man, who lived alone in a wild place and was lonely. One day he took a piece of wood and shaped it with a tool into a figure. He placed the figure in the sun by his dwelling. Night fell, and when the sun rose again the figure was a woman and she became his wife. They conceived and a child was born, but in three days it died. 'Let us move from the river to a higher place where the reedbeds grow' said the wife. And this they did. Again they conceived and a child was born; but after three days it, too, died. Again she said, 'Let us move to yet higher ground where the thick bush grows'. And once more they moved. A third time they conceived and a child was born. The child lived and he was the first Makonde.
>
> The forefather, the man from the bush, gave his children the command to bury their dead upright, in memory of the mother of their race, who was cut out of wood and awoke to life when standing upright. He also warned them against settling in the valleys and near large streams, for sickness and death dwelt there. They were to make a rule to have their huts at least an hour's walk from the nearest watering place; then their children would thrive and escape illness." (Memorandum 18.10.1938, NA, File No. 14/7).

Another story tells·

> "Our elders who preceded us were peace-loving people. They held the opinion that if he wished to live near water we must be prepared to fight for it. They advised that rather than take the risk of such wars it was better to live away from water and acquiesce in the burden of carrying it." (Ibid.).

Whatever the historical facts are the stories show that water has had a very central meaning in the life of Makonde. It has patterned their daily and seasonal life. Carrying water has become the work of women but men have also helped. During the dry season, the trip to the water source could even take the whole day (Liebenow, 1971, 223).

The women's way of life as described by an acting District officer in 1938 points to the situation of a woman who after marriage stays in her mother's area of residence

> "To fill the background of the picture it should be remembered that the Makonde are matrilocal by custom. While the young men wander in all directions in search of wives and adventure the women remain in or near the village which they have occupied since their birth. It is probable that to the majority of women, the country beyond a radius of ten miles of their village and the route to water is absolutely unknown and full of unimaginable horrors."

This was only partly the case. To ward off dangers women walked in groups and the daily trips became social occasions of meeting people also along the way.

The first efforts to bring water to the Makonde plateau were made by the British in the 1950's. Some people worried about the environmental consequences of the planned water supply. The Provincial Commissioner wrote in the year 1952:

> "The population here is already very heavy and the addition water supplies would probably cause severe agricultural problems and lack of fertility of sold due to overcultivation." (NA File 14/7).

At this moment there are about 300.000 people at Makonde Plateau, which means that there is approximately one hectar of land per capita (Hakulinen 1982, 17). Yet the authorities have been urging people from the Kitangari Valley to move up to the plateau.

When the Makonde Water Supply was finished in 1956 it was praised to be "a masterpiece of engineering". The British Makonde Water Supply was working on an economic basis and the capacity of it was about 2000 m^3/month.

A corporation was formed in which all the users had to be members and pay an entrance fee of 12 shs and a membership fee of 10 shs. Water was drawn from water kiosks for a payment of 5-10 c per bucket. People were forbidden from storing water in their homes in traditional waterpots thus preventing the use of traditional water sources. The scheme caused resentment and resistance which must be kept in mind when attitudes to the new scheme are evaluated and possible payments discussed (Liebenow 1971, 221-2).

An interesting historical detail indicates that a change in the mode of drawing water does not necessarily prevent social communication: When local elections were held in 1966 women had propagated the choice of specific women candidates at the water kiosks, with little successs (Ibid. 320).

After independence the Makonde Water Scheme was nationalized and the fees stopped. In 1978 the capacity of the water-works was still 1000 m^3/month (M. Rantala). When we visited the pumping station of the Makonde Water Supply, near Newala, four of its five pumps were out of order.

3.1.2. Mtopwa

Mtopwa with 2200 people is the central village in the Mtopwa Ward. I stayed in the village with Celina Shinyambala in a house which was hired by Finnwater for two of its workers and their wives who came from Masasi. The house belonged to an old Makonde-woman who had lived in the village her whole life. All the other people in the village were also Makonde.

People in the village were Muslims except for one or two Christians. We stayed in the village during the time of Ramadhan when all the people were fasting. During the fast it is forbidden to eat and drink except after sunset in the night. The village seemed to be very quiet and often the only sound during the day time was the sound of drums played for the boys who were prepared for circumcision.

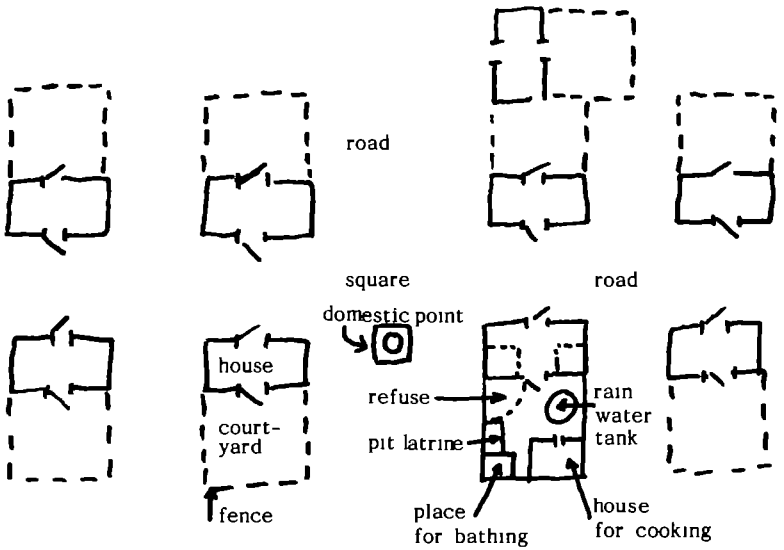
Most of the men in the village had two wives, some even four or five. Women had on an average 6-7 children. Some husbands stayed in other villages with their other wives. All the people were farmers except for 14 teachers and one shoemaker. Two of the teachers were women. One woman worked as an extension officer (Ms. Mswahilia).

The most important food crops were maize, millet, cassava, rice, potato and ground-nut. The only cash-crops were cashew nut and oil seed. During our stay in the area people were drying beans on the ground. There was also an agricultural research centre in the village where tomatoes, chicha, papaia, spinach, egg plants, lady fingers, bananas and mandarines were grown experimentally. None of them were unknown plants in that area.

The food situation in the village seemed to be quite good. In addition to the crops mentioned people raise some chickens and even a few goats and cows. According to our main informant Hemedi Nankomwa, nobody suffered from hunger. It only seemed that the relationship between the agricultural research centre and the village was not very close. According to the leader of the centre their work was to 'grow plants and write reports, not to advise people'. People could come and see if they were interested in learning, but there was no indication that such interaction existed.

The village had no market. Near the CCM-office there was a little village cooperative shop where the people sometimes could buy small necessities and clothes but at the time of our stay nothing was available. Children of school age were attending primary school. There was also a little mosque and a Koran school in which children attended in the evenings and on weekends.

The general pattern of housing in Mtopwa



The water situation in Mtopwa:

Mtopwa was connected to the Makonde Water Supply in 1958. In the 1970's the system already worked with short capacity, and Mtopwa which was at the end of the pipeline did not get water any more. After that people had to go and fetch water from Kitangari at a distance of 20 km from Mtopwa. In 1978-1979 Finnwater introduced an emergency system which was connected to Makonde Water Supply and worked for a short time. In 1980-81 the system sprang a leak when it was connected to another pipeline by MAJI (the Government Department of Water; maji = water) and about half of the water was wasted. After that water was colected for a short time from a tap at a distance of 7 km. In 1982 the village was connected to the Kitangari water works and the village has received regular supply of water from the end of that year. In this village as in others on the Plateau there were also big rain water tanks near the houses, dug by the villagers in the ground and cast of cement, about 2 m in diameter. During this and our other visits to the villages these tanks were covered by branches and not in use any more (Historical facts by M. Rantala).

Mtopwa: Rainwater tank

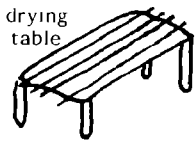
Water-use patterns in the village

The vessel for fetching water was usually a bucket but clay-pots were also used. The children carried the water in smaller aluminium vessels The average water-use per household was 5 buckets a day. Women and children fetched the water usually either in the morning or in the evening, depending on the use of water on a particular day.

pot for fetching water

calabashes

drying table



The quality of the containers varied. The closest observations were made in the house where we were staying. There was a plastic container with a lid for drinking water and a big plastic tub for washing water. Clay pots and calabashes were also used. In the courtyard there was a small place surrounded by a fence which was used as a bathroom. The washing water and refuse was thrown to the courtyard.

The dishes were washed outside by hand or grass in a small amount of water. The vessels were dried on a small table. Before and after every meal people used to wash their hands by dipping them in a bowl which was passed around after people were seated for the meal. The women washed their hands before cooking, which was done inside the house on three stones. The hands were dried in the air.

Most of the houses had a pit-latrine (cf. picture) which was situated in the courtyard. It was not often covered. Usually there was a vessel of water inside for ablution. Paper was not in use in this or other villages.

The health situation in Mtopwa·

In the Kitagari Health Centre the most common diseases of the area were reported to be: 1) malaria, 2) diarrhoea (40-50 cases/month), 3) measles for children (J. Mpiri). In Njambe dispensary the most common diseases were: malaria, hookworm, bilharzia and TB. Njambe was another village in Makonde plateau where there was not yet any water supply.

Women's meeting in Mtopwa:

In order to get contact with the women Celina and I asked the Village Chairman to summon 10-15 women to a meeting. The Village Chairman and secretary wanted to take part in it and opened the meeting.

It had been agreed by the Village Chairman and us that those women who belong to CCM or are in some leading positions would be invited. The main subjects of the meeting were: 1) the water situation in the village; 2) women's activities in the village.

1) First the women told how they collected the water before the water supply. Women, children and sometimes men used the whole day for fetching water. Now there are four domestic points in the main squares in the village but water comes only from two of them. The women thought that it was not enough. In the morning and in

the evening there is always a long queue at the water point. People from a neighbouring village where water has not yet been brought to also used the water. The quality of the water was considered to be good. Earlier people used to suffer from bilharzia but the women said that they don't have it any more.

2) Nowadays women can use more time for home-work and different phases of field work. They go earlier to the fields and stay there longer. The production has already increased. However, there is not enough water for agricultural use. When the pipeline was made everybody in the village had to participate in the digging of the ditches.

We did not obtain statistical proof for the increased production. Mere village figures leave factors influencing them concealed. It would have meant another study to make a thorough analysis of the changed village patterns of cultivation and out-migration, reduced cashew nut production on account of disease and monitoring changes in different seasons. Whether the production really had increased or whether the women just thought that they now have more time for cultivation is a topic for further study.

The women had no women's groups or other joint activities. According to the women, they could not start them because men controlled the cash and did not give them money to invest in any enterprise. Women also lack leaders. Contrary to the Party regulations there were no women on the village council. According to the Party instructions there should be at least two women on the village government. This is the case for example in the Coast Region which also is a predominantly Muslim area.

There is a discrepancy between the traditional matrilineal system in which women determined the leadership and the present system in which women seem to have been pushed aside.

After the meeting we agreed with the Village Chairman that the women who had not been present at the first meeting would attend another meeting the following day. We went to the CCM-office at the agreed time the next day but there were no women around. Instead there was the whole Village Council having their meeting. The Chair man simply said that the women had not been invited.

Maybe the men were just curious to see us but you cannot help thinking that the men were not very keen about the women's gathering. One woman had told us after the previous meeting that women had earlier had corporate groups but that they were no more active. Women had had e.g. a common field for cultivation but when the village began to charge money from them they stopped farming. Another woman had come to us to discuss the prospects of starting women's groups. Contrary to this, the educational officer in the village considered that it is difficult to get people to understand the meaning of groups. The Chairman and the Secretary expressed as their opinion that there was no need for women's groups because the women's place was in the home.

Mtopwa is part of a traditional area in which the elders had in the end of the 50's resisted the Makonde Water Scheme with the excuse that relieving women from water carrying would leave them with too much time to get themselves into a mischief. This would have been the case especially with those women whose husbands were working on sisal estates in Tanga or Lindi or employed elsewhere away from their home villages (Liebenow 1971, 223). The traditionalists tried to prompt the women of the village to think of their situation. Water and women is a subject with sensitive undertones among the Makonde.

3.2. The Lindi District: the Villages Kinyope, Rutamba and Milola

3.2.1. Kinyope

The Kinyope village, with a population of about 2000 people is situated on a hill close to a fertile valley where the Rutamba river runs. The people of the village belong to the Mwera and Ndonde tribes. With

the exception of a few Christians they are Muslims by religion. Due to the fertile land the village has been chosen as place for the RIDEP Rice-project to experiment different species of rice in order to select the most suitable ones for the area.

The most important food crops in the village are rice, millet and cassava. Every piece of land in the valley is titled to someone through a system of traditional land tenure but not all of the land is cultivated. This is due to the fact that some people claim bigger areas of land than they are able to cultivate. The villagers were not very willing to take the rice project to the village because they were afraid of loosing the land titled to them to the project.

Kinyope was chosen as one of the main villages for this study in order to be able to compare the situation there before and after the construction of the wells. The plan did not fully succeed because the building phase was postponed many times. During my first visit I went to Kinyope for five days with Celina Shinyambala and Jim Grindey, who was in charge of the RIDEP Rice-project. We also visited Rutamba and had a women's meeting in both villages. Two months later I went back to Kinyope with Jessy Nandonde for ten days and also visited Rutamba, Milola and Ngapa. The following month we came back for another stay again for five days during the time of the construction of the wells. On my last one-day visit to Kinyope the wells were nearly completed. Unfortunately I had to leave the country before the people began to use the new water supply. No pro and post comparison could thus be made.

The water situation in Kinyope:

The natural water source in the village has been the river, where the water flows the whole year. People take water from it at 5 different points. The average use per household was said to be 6 buckets a day. People wash their clothes in the river and children play in the same places.

Kinyope River

On one of our visits to Kinyope village the school children were making bricks for the school building. Equipped with small aluminium containers, everybody had to carry water from the river up to the school where the bricks were made.

The villagers did not identify their village as being part of the Finn-water programe, they were expecting to get water supply from MAJI in general. There was one domestic point previously built by MAJI which had no water because the pipeline had not yet been built. The villagers said that they did not want to dig the trenches before the nearest village with the pipeline gets water. Having had a tap with no connections they had obviously grown suspicious about the prospects of actually getting the water. The external equipment might have been an empty promise only. This speaks of an attitude developing under similar circumstances in which earlier promises made have not led to concrete results.

The health situation in Kinyope

People from Kinyope used Milola dispensary or Rutamba Health Centre when they needed medical care, both at a distance of about 10 km from Kinyope. The Medical Assistant gave health education to the

patients every day at the Health Centre. He gave lessons to the people in the courtyard. In Mlola health education was provided twice a week at the school, according to the health workers. In the previous month the health worker from Rutamba had come to the Kinyope village hotel to check the hygiene of the hotel. In addition to the official medical services people also went to waganga, local "doctors". A local nurse knew of three of them, one of them a woman in Mlola. (Mr. Kipengele.)

Due to the habit of bathing in the river polluted with disease carrying snails many people suffered from bilharzia. Other common diseases are intestinal diseases with symptoms of diarrhoea; malaria and philarioses or elephant disease, a swelling of a leg out of proportions. In 1977, there was an outbreak of cholera in the area. During that time people were told to boil the water which many did while the epidemy lasted but at the time of the study people had returned to their pre-cholera ways. The women said that boiling the water took too much time or that they were already used to the water as it was. Upon questioning the villagers claimed to have pit latrines in the village (according to the villagers in all the houses) but the quality of them was not good (e.g. they were not covered). People seemed to know the relationship between contaminated water and certain diseases but they overlooked it in their behaviour.

Education in Kinyope.

Of the villagers 80 per cent could read. There had been a school in Kinyope for 10 years but not all the parents were interested in sending the children to school according to the teachers. The existing school house was too small (there were 4 classrooms for 324 pupils) and the parents should have been obliged to build a new one but they were not willing to do it, it was left for children to do it instead. (Mr. Mmbaji and Mr. Wumbura.)

At school teachers organized adult education groups in which people could study e.g. mathematics, agriculture and politics. Two women and more than twenty men were taking part in these lessons which

in Tanzania are referred to as Kisomo cha kujiendeleza, lesson for one's continuing learning. For illiterates there was a group in reading and writing. All the teachers were men with the exception of the teacher of home economics. There was no evidence in Kinyope nor in the other villages that adult education channels would have consciously been utilized by health educators or members of the water project for discussion about water use, well construction or sanitation.

The adult education is dependent on government support for supplies and small payments if volunteers are used for teaching. In Kinyope teachers did the teaching.

The Divisional Education Officer from Milola was inspecting the school and was obliged to arrange seminars for the staff about various things e.g. farming, health, cattle husbandry, the policy of the country, economy and educational schemes. He visited Kinyope twice a month. This programme had become necessary after primary education became compulsory when Std. 7 leavers have been taught on a job to become teachers in the primary grades. (Mr. Mtotonwema.)

Near Rutamba there was a Folk Development College where there were courses in carpentry, agriculture and home economics (cooking, sewing, child care). The courses lasted 1-6 months. The pupils for the courses were chosen from the villages by the District Education Officer and the Agricultural Officer. Women had been attending only the course in home economics. There had so far been no utilization of the Folk Development College either by the water project or the Health Department. (J. Pilla.)

Kinyope women's meeting:

A meeting for women was summoned by the Village Chairman on our request but the idea of the meeting was not made clear to the women. They came to the meeting because they had been told by someone that we were selling khangas. However, after seeing that we were not they did not leave the meeting. The women were interested in getting wells to the village and said that they were ready to work

for that. Their previous experiences from co-operation were not very good. The people had once built a school but since they had not received any material for the roof the walls had fallen down. They had also built a dispensary in the village but they had not managed to get any health workers there. UWT had two shops but there was seldom anything to sell. The women were interested in getting a sewing group started in the village but they did not know how they should organize themselves in order to get one. The women did not believe that someone from the District would come to the village to help them. There was only one woman in the Village Council.

The women's working day during the shorter cultivation season was in brief the following:

5.30-6.00	waking up cleaning the yard
6.00	fetching water from the river preparing breakfast
8.00-10.00	going to the fields
10.00-14.00	working in the fields
14.00-16.00	coming back from the fields
16.00	preparing and cooking the evening meal
19.30-20.00	evening meal
21.00	going to sleep

(M. Kaunje et al.)

The richest men in the village had many wives (up to 5) who were working on their shambas. There were also many women staying alone and they were the most active when it came to contacting us. One of these was the woman who belonged to the Village Council. She was a farmer and lived with her mother and son.

3.2.2. Rutamba and Milola

Rutamba is situated about 10 km from Kinyope in the same division (Milola). It consists of two villages, Rutamba A and B, with a population of over 5000 people altogether. There is a small market, some shops and small hotels (closed) in the village. The big Health Centre in Rutamba was built for the refugees from Mozambique when they had a camp in the village in 1976. Most of the refugees have returned back to Mozambique already. There is also a small Catholic parish in the village.

Milola is the head-quarter of the division. The population is 1441 people. In the village there is a Post-Office, market, Police Station, Court and a small Dispensary.

The water situation in the villages

In Rutamba a small pumping station had been built in 1974 but due to lack of fuel it was not working during the time we visited the village. Close to the village there is the Rutamba lake where the water is salty. In 1982, Finnwater built 25 wells in the villages A and B altogether. In some of them the pumps have been changed by a World Bank researcher. He studied different types of pumps one of which was the Nira-pump. The idea was to find out which was the most suitable pump for the Third World Conditions. In Milola there were no Finnwater wells. Few older ring-wells without a pump or cover were at a distance of half a kilometer.

The health situation in Milola and Rutamba·

According to the health workers in Milola dispensary the most common diseases and their average occurrences in the area were· 1) bilharzia 250 cases/month, 2) hookworm 100 cases/month, 3) diarrhoea 50 cases/ month, which all are water-related diseases. Pneumonia and pulmonary tuberculosis were also comon.

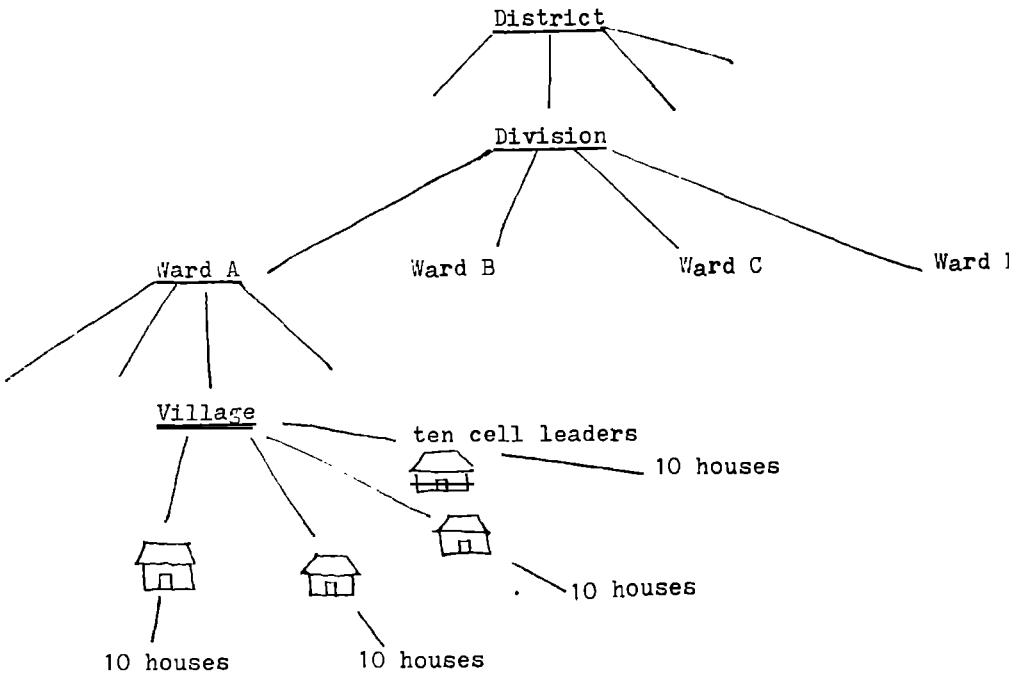
For the children the most common diseases were. 1) malaria, 2) anemia, due to hookworm, 3) measles, and due to the complications diarrhoea, pneumonia and stomatitis, 4) conjunctivitis in the eyes.

In the Rutamba Health Centre most of the common diseases mentioned by the Medical Assistant were also related to water. The common diseases were given in the following order: 1) schistosomiasis, 2)diarrhoea, bacillary dysentry, typhoid, 3) amoebiasis, 4) giardia· scabies, conjunctivitis, pediculosis.

In addition to these following information was given by the Medical Assistant in Rutamba Health Centre:

- About 50.000 people visit the Health Centre a year of which 15.000 are children attending the clinic for vaccinations and weekly prophylaxis expecially for malaria.
- The wells play an important role in the health situation but problems of the wells are that they are too shallow and the water is too salty. Due to the distance to the well with fresh water very few wells are used at present. This makes the health situation difficult. Another factor has been the misuse of wells which has brought some damage to them.
- There is a great need to improve hygiene and sanitation conditions in the villages as most diseases of this area are due to poor latrines, or sanitation in general.
- The organization of hygiene and sanitation education should involve the ten cell leaders and respective ward and divisional leaders. There should be an organized programe in cooperation with the health workers and teachers.

Proposed organization which exists and which could better be utilized in health education and sanitation programmes:



It seems that health workers are aware of the problems and the ways of solving them but concerted action is missing. The question seems to be how the water project could stimulate such an action since the health personnel without special contacts made with them does not know about the plans or implementation of them.

Women's meeting in Rutamba:

The meeting was held in the village Rutamba A where there were 2122 people and 12 Finnwater wells made in 1982. Like the other meetings the meeting was summoned by the Village Chairman. According to the women in only three of the wells the water was good for drinking because the water was salty in the other wells. All the wells in Rutamba B were salty and the people came from there to Rutamba A to fetch water. The pumps have been working well. There is only one well where there was no water coming

and one which people did not use. The villagers were paid for building of the wells. The women were ready to participate in the building of new wells if they could get them.

According to the women the health situation had improved in the village after they had got the wells but there was still a lot of bilharzia. The women thought that the people suffered from it chronically. The surroundings of the wells were not kept clean. According to our observations also, the surroundings of the wells were often muddy. There were three pump attendants in the village which had been trained by MAJI. They took care of the pumping station but could not repair the wells. (Later Rutamba got a Finnwater pump attendant also.)

The women had a shop where they sold tea. At that time the hotel was closed because there was no sugar available. The Village Manager was a woman. She had been transferred to the village from Lindi. She showed us the different wells with different pumps installed by the World Bank researcher and told that people liked the Finnish and Duch models of pumps most.

3.2.3. Kinyope During the Time of the Construction of the Wells

When I went to stay in Kinyope the second time I was working with Jessy Nandonde. We were asked by the Finnwater training engineer to inform the villagers about the well construction group which was due to come to the village after 1-2 weeks. No preparations had been made earlier in the village. The situation made me represent Finnwater to the villagers which was not an ideal situation for a researcher but gave me a chance to observe people's attitudes in such a situation.

We asked the Village Chairman to summon people to two meetings. The first meeting was only for the women and the other one for the whole village. Following information was given to the villagers.

1) The Finnwater well construction group is coming to the village in two weeks to build wells together with the villagers if the villagers agree to it. Finnwater is going to give the materials for the wells and provide some experts who will lead the working groups. Finnwater presupposes that the villagers organize the working groups themselves and have them ready for work when Finnwater comes.

2) The working groups should work on a self-help basis. Finnwater is not going to give any salary to the workers. There is a need for five groups with eight people in each of them. If the people are not ready to work when the well construction group comes, they do not get any wells.
3) During the time of the construction of the wells 3 pump attendants are going to be trained. The villagers should choose 3 persons for this training. At least one of them should be a woman. The villagers should also be ready to pay some kind of a salary to the pump attendants when they repair a broken well. There is also a need of a larger group of people who should know how the wells are working. All those who are interested can follow the instruction.
4) The villagers should set up a water committee (3 men and 3 women) which would be responsible for the wells. Some of them could also be members of the health committee.
5) Finnwater is going to sell the tools for the repairing of the wells at a price of 500 Shillings.
6) When the wells are ready and the pump attendants trained Finnwater is going to make a contract with the village according to which the wells are handed over to the villagers.
7) The village can get spare parts for the wells from the Idara Ya MAJI in Lindi when they bring a broken part there.

We took it upon ourselves to further define the tasks for the water committee in order to give some ideas to the villagers on what kinds of things they would be expected to discuss together:

1) supervising the work of the pump attendants
2) making rules for and with the villagers how to use the wells
3) planning how to keep the surroundins of the wells clean and organizing e.g. gardening around the wells
4) seeing to it that the villagers get education in issues relating to water and health
5) making further suggestions about improvement of the water and sanitation situation in the village e.g. places for washing clothes and bathing, and better pit-latrines.

Two meetings were held where the previous information was given and discussed. For the first meeting only women were invited. The meeting was held in a big granary and attended by 40-50 women. The discussion about the matters was lively. Some women entered

their name for the training.

At the end of the meeting the Village Chairman came and began to accuse the women. As in other similar occasions here again a meeting with women raised antagonistic feelings in the village leadership and most likely in men in general. The Chairman held a long speech where he reported different things which the women had not taken care of. The first was the UWT shop which was in a wrong house. After that he accused the women of not using their licence to RTC (Regional Trading Company) and buying things from other persons instead. It was also said that the women borrowed things from the shop without paying for them. All those who had taken something from the shop were told to give their names and pay their bills. If they would object action would be taken. The shops were said to be down and without any stocks. Furthermore, the women should work more on the ujamaa shambas in order to get money for buying things, the chairman concluded.

Whatever motivation we could have awakened in the women toward the water project the subsequent outburst of the village leadership certainly was aimed at keeping women in their place.

In discussions with the villagers it was revealed that it had happened that common funds had been misused or stolen but that people did not dare to express their thoughts about it. According to the Bwana Shamba they were afraid of witchcraft. To us it seemed that there was great mistrust in general between the villagers. It was also the experience of one of the teachers that it was difficult for people to co-operate when organizing community action. The reason for that in that case could also have been that cooperation was instigated from above. The general atmosphere was not conducive for introducing a new project for which people were supposed to feel responsible. The fact that people could air their opinions made the introduction of the well project in this case different from other places in which the initial contact had been more casual.

The next meeting was postponed because the Chairman had not summoned it on the agreed day. We suggested another date on which the meeting washeld. The same information was given to the villagers as in the previous meeting. At this time, the members for the water

committee were chosen and the people discussed about the situation of the wells. The Chairman promised to mobilize the groups for the cnstruction of the wells. Some people said that they did not want to work without payment. They were apparently aware that in Rutamba on an earlier occasion money had still been given to the workers when the wells were made, but the Finnwater policy had changed after that.

The day for Finnwater's coming to the village was postponed many times. At last the well construction group arrived 6 weeks later than expected. After that some days went in waiting for the transport in order to bring the tools to the well construction place. Conspicuously, the Chairman was not in the village and no working groups were organized. People were still resisting work without payment. They were also disappointed about getting only four wells. The amount of water was considered to be more important than the quality of water. Some people suspected that the water of the wells would not be better than the water of the river because the wells were so near the river. However, later on the people were promised an additional well. The works could not start until one week later because there were no working groups available. Some volunteers, all men, were helping to build the wells but the Chairman did not mobilize any working groups. At last the building of the wells seemed to be so difficult that only four wells were finished. One well which was already half-made was left unfinished on the decision of the Well-Construction Superviser. No further discussions were held between Finnwater and the villagers.

According to this experience the responsibility of building of the wells did not belong clearly to anybody. The Finnwater workers in the well-construction group did not even know where they were going to build the wells next. They always had to wait for the orders of the Well-Construction Supervisor who only visited the group in order to pay the salaries and to give instructions. The Well-Construction Supervisor himself said that the responsibility has to lie in the villages.

Four wells is not very much in a village with a population of 2000 people. Even though the people take their drinking water from the wells it is difficult to say whether they become healthier if they continue bathing in the river. Even the Finnwater workers of the well construction group said that they were often sick due to the water of local wells which they used when they were staying in the villages.

To summarize the experience, the village leadership resisted the well project from the start. Organizing the first discussion with women may have contributed to the irritation of the chairman. Also the fact that women wre sent to discuss the matter may have had something to do with the response. Maybe it would have been the proper procedure to allow the chairman to introduce the whole matter, also to the women, and we as visitors should only have added our bits of information. My assistant was a local young girl and in this occasion had to carry an inordinantly large share of the speaking, because of my poor Swahili. This only emphasizes the importance of proper procedures in approaching the villages.

3.3. The Masasi District: the Villages Chiwale, Lukuledi and Napata

The Masasi District has been one of the problem areas in the Finnwater project. Most of the wells in the area were built during the rainy season in the year 1980 when the water situation was good. After that there were two very dry years (1980-82) when most of the wells dried. This was a big disapointment for the people. In the Masasi District there were also villages where people had broken all the wells (Songambele, Makulani) or did not use them (Maneme, Nanjota) (M. Iikkanen).

The first trip to Masasi I made with Celina Shinyambala visiting the Chiwale and Lukuledi villages. During the second trip, made with Jessy Nandonde, we stayed at Lukuledi and visited the Napata village. In all the villages we had a women's meeting; at Chiwale we asked the women to fill in a questionnaire by writing.

3.3.1. Chiwale (1603 people 813 women, 790 men)

We visited the village for a very short time during one day. Because our time was limited I thought that we could get most information by the questionnaire. I also wanted to develop the content of the questionnaire with Celina Shinyambala later. We asked the Village Chairman to summon women to a meeting for filling in the forms.

There were 4 people (Celina and 3 Community Development Officers from Masasi) assisting the women to fill in the forms. They also wrote the answers on behalf of those women who could not write. After the meeting

one woman showed us the wells in the village. Finnwater had built there 5 wells but people used pits and local wells also. Of the Finnwater wells 3 were broken and in one of them the water was not clean. All the wells dry out during the dry season and people have to fetch water from Nachingwea or Nambawala at that time. In spite of the difficult water situation people were planning to build a Health Care Centre in the village.

Answers to the Questionnaire (Annex 8)

Thirteen women answered the questionnaire. One was of the Yao, the others of the Makua ethnic groups. They were on an average 23 of age and had on an average 1.5 children. Because of the limited value of the exercise, only a brief run down of the answers is given below. The discrepancy in answers is partly due to different locations of people's houses, but shows also the inaccuracy of questionnaire information in the circumstances. The dissatisfying water situation, which became clear to us only afterwards, must have frustrated the women when trying to relate it to the questions.

Number of answers in brackets:

1) year of building the new wells: 1982 (8), 1981 (2)
2) distance to the nearest well: 1/4-1/2 miles (3), 2 miles (1), 1/2 km (2), 1 km (3), near (1)
3) old water-source: rainwater, lake, Nambawala, Nachingwea
4) distance to the old well. 2-3 miles (2), 4-5 miles (1), 1/2 km (6), 1 km (1), near (1)
5) participating in the building of the wells: yes (11), no (1) - indicating that people participated in digging the wells; women were employed (2)
6) do people from the other villages use the well? yes (3), no (7)
7) hours per day used for collecting water: 15-30 min. (3), 1/2-1 hours (3), 3 hours (6)
8) time used for collecting water before the new wells: 1/2 hours (2), 3 hours (8), 1 day (1)
9) do they use more water now than before? yes (5), no (7)
10) for which purposes do women use water most? cooking (11), drinking (8), washing (2), bathing (2), farming (1)
11) if using less time for collecting water what do women do instead? cooking or house-work (10), drinking (7), farming (3), bathing (1), other works (1)
12) has someone informed how to use the new well? yes (5), no (5)

13) how was the place of the well decided? the villagers decided it (4), Finnwater decided it (3), MAJI decided it (2)

14) is there enough water in the new well? no (11)

15) where do they take water if the well is dry? Nachingwea (5), Nanyindwa (2), Nambawala (9)

16) quality of the water in the new well? good (13), some smell (6)

17 quality of the water in the old well? good (10), salty (2)

18) most common diseases? dysentry (7), coughing (7), stomach-diseases (6), eye diseases (5), measles (5), malaria (3), head-ache (2)

19) diseases during the last year: dysentry (4), stomach-ache (4), eye-diseases (3), measles (2), malaria (1), coughing (1), head-ache (1)

20) is the surrounding of the well clean? yes (7), no (5)

21) did the people wash their clothes at the well? no (9), yes (4)

22) has the well been broken? yes (12)

23) what was the reason for that? dryness (5), sand (1), I don't know (2)

24) who repaired the well? Finnwater (6), nobody (4), people from Masasi (1)

25) have they seen someone damaging the well? no (12), children have played (1)

26) is anybody taking care of the well? yes (11), no (2)

27) how was she/he chosen for that job? by the village (11), I don't know (1)

28) does she/he get a salary for that job? no (10)

29) are there any rules for how to use the well? yes (10), no (2)

30) do you use water for animals? yes (chicken and ducks) (9), no (3)

31) do you use water for gardening? yes (8), no (2)

32) what kind of crops do you grow? tomatoes (2), spinach (2), onions (2), cabbage (1), maize (9), cassava (7), millet (7), sesame (3), beans (2), ground-nuts (1)

33) what kind of development programmes are there in the village? cashew-nut farm (1), lumbering (1), hospital (6), road (2), I don't know (2)

34) what do the women usually do in their spare time? plaiting hair (4), making mats (1), pottery (1), house-work (5), visiting (3), pounding (1), cooking (11), playing net-ball (1), sleeping (1)

35) are there any women in the Village Council? no (4), yes (3), I don't know (1)

36) do you attend any a) adult-education or b) women's groups? a) yes (7), no (3); b) yes (2), no (3)

37) are you a member of any co-operative societies? yes (3), no (7), CCM yes (1), no ( ); UWT yes ( ), no ( )

38) how would you like to improve the water situation of the village?

- I would like to have piped water from Ndanda so that we could have more water (At Ndanda there is a large Catholic Church centre with training institutes, schools and a hospital and water availability is constant)
- more wells (8)
- repair the broken wells (2)
- wells where there is water throughout the year (2)
- machines (1)
- I don't know (1)

39) how would you like to improve women's conditions in this village?

- more services, especially water throughout the year (3)
- grain mill (8)
- road (5)
- I don't know (2)
- shops (2)
- transport facilities (1)

40) other comments

- the questions were good (2)

Comments on the Answers of the Questionnaire.

There were four people (Celina and three Officers from Masasi) assisting the women to fill the forms but still writing seemed to be very difficult to them. The assistants had to explain many questions to the women which might have affected the results also. The exercise and the inadequate results of it determined the further course of the study. As desirable as it would have been to get some statistical information, this was not the way to go about getting it.

The estimates of the distances or times used for collecting water differ markedly from each other. Either the women understood the questions in different ways or the valuation was too difficult to them. The distance to the old well was in some cases taken to mean the old water source in general, which explains that six answered only 1/2 km. The old water source, when said to be rainwater, was a dug hole in the ground near the houses. The time used for collecting water before and after shows difference only in three cases. This does not jive with the answers

to question 15 where the present place for drawing water was in all cases in another village. On the other hand it explains why six answered they used three hours even with the new wells. In reality the time spent was even more.

According to the answers the villagers had participated in the digging of the wells, some women said that they had been employed. Only five women said that they used now more water than before, for seven there was no difference .Cooking and drinking were the most important uses of water. Washing and bathing were mentioned only by two women and farming by one. Bathing had obviously been done at the water source. Still most of the women said that they used water for gardening. Cooking and house-hold activities in general were said to take most of the women's time if time was saved from fetching water. It was also mentioned to be the most common activity during the spare time which may include the idea that there is no spare time at all. Only three women said that they used more time for farming if they did not have to collect water from a distance. The time used for drinking probably indicates that the question was understood to refer to the use of water and does not mean time spent in beer drinking.

To the question how the place of the well was decided the women gave three different answers (villagers, Finnwater, MAJI). All had the opinion that there was not enough water in the wells and reported that the wells had been broken. The reason for the broken wells was most often said to be dryness. Quality of the water was said to be good in the new wells by all those who answered but ten thought that the water had been good also in the old wells. It seems that the women did not see any big difference in the quality of the water in the older and new water points which may affect the water-use patterns. On the other hand, the fact that six of the women added the bad smell afterwards shows a common thought pattern whereby the positive is first affirmed before turning to the negative. Another point which makes one time information uncertain.

The most common diseases in the village were said to be dysentry, stomach-diseases and eye-diseases, which are all related to water as is also malaria. One third of the women said that people wash clothes at the wells. Cleanliness as a concept was not qualified in the question which partly explains the differing answers. Someone in the village was taking care of the wells but he did not get a salary for the job.

The women were uncertain whether there were women in the Village Council or not. About half of the women took part in adult-education groups but nobody reported to be a member of the UWT and only one of the CCM. More wells were needed in the village. Other things that women would have liked to have were a grain-mill, a road and shops.

3.2.2. Lukuledi (3912 people 2040 women, 1872 men)

Lukuledi is the biggest village of the district with nearly 4.000 inhabitants. The people are mainly Makua and the village is a traditional one. There is a big Catholic centre which is the seat of the Bishop. There is also a school for craftsmen (ufundi) and a Makonde-carving workshop in the village. The women have a pottery group.

The Catholic Church[1] has quite a sizeable influence on the surrounding areas. It has founded four hospitals, one of which is in the village. Every day about 100 people visit the hospital. When we visited the hospital there were 23 in-patients and about 20 women in the maternity-ward. The hospital was run by 6 nuns and 11 nurses, with no doctor. The church had also founded a girls' school which had been handed over to the Government. For children there was a day-care centre also run by the nuns.

1) The Church is often referred to as a "mission", because the stations were earlier run by missions from abroad. Now even the foreign missionaries all work under the Tanzanian churches with local leadership.

The water situation in the villages.

Traditionally people have used dug pits for taking water. The British Colonial Government had built a dam in the village in 1955-56. The dam created a water reservoir about 150 m by diameter and 3-4 m deep. When we visited the dam, the school children were making a shamba on the other side of it. The trees were cut which may result in the dam being washed away little by little. The water in the pool was dirty (according to the missionaries) and there were some fish in there. There was also another smaller dam, forming a smaller pool for watering cattle. It had been built by the Church.

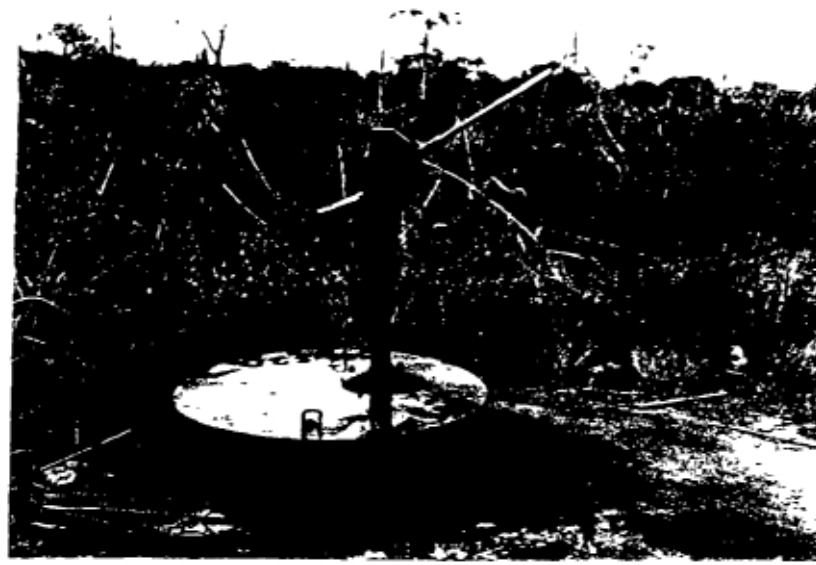
Lukuledi, Dam

The water supply of what was commonly called the "Mission" had been solved by collecting rain water from the roofs into three underground water tanks. From the water tanks the water was pumped up to the church tower from where it was led by gravity into the houses. In the 1970's the Mission had made plans to arrange the whole water supply in the village but the expenses were lifted so high by MAJI that the plans were given up.

Some of the Finnwater wells were made on the old pits. One handauger well and three ring wells made by the villagers as well as one ringwell made by Australian aid had the Finnwater pump. In addition to these

Finnwater had made seven other wells of which one was a borehole. The villagers had later deepened two Finnwater wells. The wells were quite far from each other on a large area.

When I visited the wells with one Brother from the Mission six of the 12 wells were in order. In three wells the footwell of the pump was broken, in one well the handle was out of order and in two wells there was no cover nor a pump. The villagers had changed one pump to another well.



Lukuledi Well

According to the pump attendant of Lukuledi there were good places for wells in the villages. According to Finnwater there are not. The pump-attendant had received 5 months long training by the Finnwater maintenance group. He took care of several villages (Napata, Nambawala, Nanyindwa, Chiwale, Mraushi, Nasendi and Chikunza). He got a small salary (20 Sh) from the villagers when he repaired a well. His main problem was the transportation the wells were far from each other and he did not even have a bicycle.

The women's meeting

About 15 women were present. The meeting had been summoned by the Village Chairman who opened the meeting. After that he went out when we said that we would like to talk between women.

The women were of the opinion that the places of the existing wells were not good. In seven of the wells the water was salty and in three of them there was no water at the moment. All the wells dried out during the dry season. The women thought that there might be some better places for the wells e.g. at the Nwassajet which is near the village. People also used the dam-water. They did not boil the water. The women making pottery would have liked to have one well at their working place. They were ready to dig it themselves and asked if they could get a pump to it. The water for the pottery should not be salty. Each household used on an average of ten buckets of water per day. The people wanted to get piped water from Ndanda or have more and functioning wells in the village.

Catholic Women was an active women's association in the village. It had e.g. a sewing group which met every week. Other women's organizational activities had folded up. The leader of the UWT had not summoned women to a meeting for a long time. The women had complained about it to the Village Chairman but he had not done anything about the matter.

At one time when the women had collected money in order to have a shop in the village the village had taken over the shop. The women

thought that there could be many things they could do in the village but they had no money and no suitable leader. On the Village Council there were four women which reflected the activness of the women in Lukuledi and the influence of the Church women.

During our visit to Lukuledi the Catholic Women had a big celebration. We were invited there as guests of honour. In the morning there was a service for the women in the Church. After that people went singing to the place of celebration, where the women had brewed beer and prepared food. The Bishop held a speech and after that people stayed at the place the whole day eating and drinking, singing and dancing together.

Women brewing beer

3.3.3. Napata (1588 people· 774 women, 814 men)

Napata is a village with three Finnwater wells built in 1980. People also used five local pits. Near the village there is a river which is used for watering cattle.

Women's meeting:

The Village Chairman of Napata had got a message from Lukuledi Village Chairman that we will visit the village at a certain day. People were already waiting for us when we came there. About 15 women and some men attended the meeting.

People used both traditional water sources and Finnwater wells, for drinking and washing. In the pits there was water the whole year around and people from other villages also came to use them. The Finnwater wells on the other hand always get dry during the dry season. The Finnwater Training Engineer gave as a reason why the pits had water while the Finnwater wells went dry that the level of water is very near the ground. The Finnwater wells may have past the layer where there is water so that no water seeps through into the well. The walls of the dug hole are lined with concrete rings which prevent the water from getting through, and the soil below the water level is hard so that the water does not penetrate into the lower layers of ground.

The water from the pits and the water from the Finnwater wells was considered to be equally good but the water in the Finnwater wells as a little salty. Someone thought that maybe it could be used for making salt. Productive uses of water in the village were pottery and making pombe. One of the Finnwater wells had collapsed when it was built. In one of the wells the pump had been broken for two weeks. According to the women the Finnwater maintenance group visited the village quite often and liked to drink pombe there. The Chairman had been asked by MAJI if the village was willing to be connected to the pipeline from Ndanda but he had not liked the idea.

In Napata, people did not seem to be very worried about the water situation. The average water consumption per family was said to be about 6 buckets per day. There were alternative sources of water and the new wells had not, to their thinking, improved either the quality of water (the water was saline only in the new wells) nor increased the quantity (only the new wells went dry). Unless people comprehend the nature of bacteria they hardly would in the case

of Napata opt fordry and salty wells. For the whole Masasi District Finnwater was waiting for heavier rigs so that they could penetrate to deeper layers of ground. .

A pit and a well ring. (Napata)

3.4. Conclusions

Women's participation in the planning and implementation of the project has been very low. The only involvement of women has been in providing free unskilled labour e.g. in trench digging. In most cases the implementation of the project has left the local community without any role in taking an original initiative in the water supply. Recently there has been the possibility for the villagers to make the wells on a self-help basis, which may increase their participation in the well construction project.

Finnwater does not know about the plans of MAJI. People in the villages can be offered water supply both by MAJI and Finnwater. The villagers often have unrealistic expectations of the water supply and prefer piped water system. In the areas of piped water system the benefits to the villagers are more manifest but the problems lie in the reliability of the water source. The maintenance of the system is dependent of the availability of fuel which is very unsafe. The possible future cost of the water supply to the villagers has not been discussed and people believe that they will not need to pay for the water.

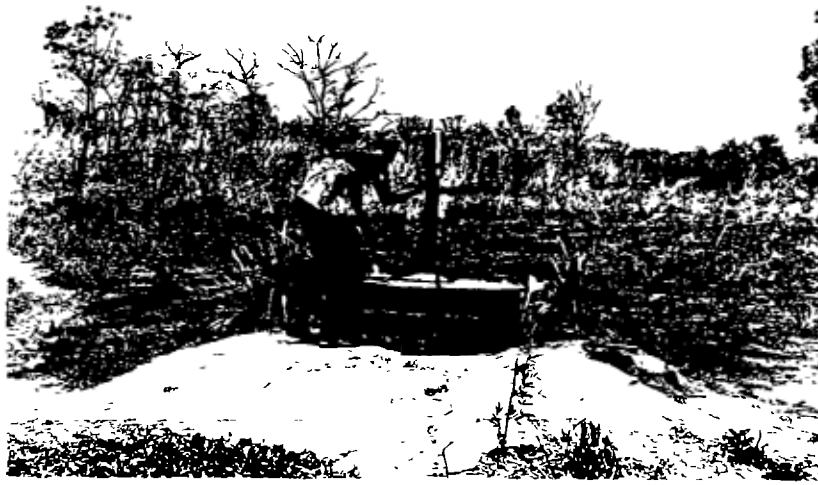
The mobilization of the people in the villages for self-help activities has been dependent on the village leadership, the contact with which has been vague. The project has not given any assistance in organization of village work. Often the villagers tend to consider that the installation is not their responisbility but rather that of Finnwater.

If tasks concerning the water supply, e.g. construction of the wells, are offered to women they are ready to participate in them. In many cases women would have liked to have wells in different places or more wells than what the survey group had decided. Often the wells were constructed in places where people already had an easy access to water. Distribution of the water points was not considered sufficient. In many cases the time women use for fetching water has been reduced anyway.

If there are not enough wells and women have to queue in order to get water they easily continue to use other water sources if they are easier at hand. Access to contaminated water sources makes the real benefit of the wells questionable. Women did not always see any difference in the quality of water in traditional and new wells. Supplementary inputs are necessary if water is expected to produce noticeable health benefits.

Other remarks·

- Drying of the wells was a problem in some areas. Another problem was salty water.
- The bacteriological condition of the wells has not been investigated by Finnwater.
- The surroundings of the wells were often dirty. Only one well was seen where the drain water was channelled into a garden.
- No further improvement in water-related village development has been introduced by Finnwater.
- Women's co-operative activities were not often supported by the village leadership.



An old woman at a well.

4. WOMEN AND THE TRAINING PROGRAMMES OF THE PROJECT

4.1. Women and Occupational Training

4.1.1. Foremen and Water Technicians

In the spring 1983, 21 and in the autumn 18 Finnish experts worked in the project. The Tanzanian staff was about 150 monthly paid and 200 daily paid workers. The temporary workers were employed a few days less than 3 months after which according to the Tanzanian labour regulations they would have had to be employed on a permanent basis. The practice of dismissing workers before 3 months and re-employing them again later was said to be practiced also elsewhere in Tanzania.

About 150 Tanzanians had participated in training in one way or another. Water technicians are the largest group of trained people. The others trained are the foremen and different skilled working groups. For foremen the ability to speak English has been demanded.

The motivation of the trained, permanent workers was higher than that of the temporary workers, whose lack of concern for what they were doing was often quoted by the Finnish experts. The basis and working conditions of employment had an obvious bearing on the conduct of the workers.

None from the previous employees had been women. There were only four Tanzanian women working in the project: two secretaries, one clerk and one woman working in the spare part store.
If the project members had been alerted to the fact that women should have been given special consideration, as the Finnish aid policy states, it could not be seen in the employment policy.

4.1.2. Pump Attendants

By 1982 25 courses had been arranged in which 334 pump attendants had been trained. The training was arranged in some central village or ward during 1-2 days. It did not seem to be very successful. The training was not sufficient and many pump attendants simply disappeared after it (Progress Reports 1982).

In 1982, Finnwater started the training on a different basis. The selected trainees from the villages and MAJI District Offices were now trained with Finnwater maintenance units. During the training period the trainees were given a minimum salary and after the training required tools were sold to MAJI offices on self-cost basis. The need for co-operation between Finnwater and local authorities was recognized (Progress Reports 1982 and 1983).

New systems of training:

In 1983 Finnwater got its first woman engineer who became the Training Officer of the project. She had been preparing for work in a developing country during her training and had attended a special 4 month course organized by the Institute of Development Studies, University of Helsinki, in cooperation with the Training and Research Centre of Lahti. At the same time more emphasis was given to the training at village level.

The new training was connected with the re-organizing of the shallow well maintenance. The objective of the training programme was to create a three-level maintenance system, which would be based on independent work of the village pump attendant. The three-level maintenance system would replace the existing centralized maintenance system operating from Mtwara. The maintenance costs for a well had been about 1.000 Tsh/year, 50 per cent of which consisted of transport and salary expenses. With the new system the expenses could be considerably dropped (Proposal for the Training Programme 1983-1986).

The three levels of the maintenance system are:

- Village level, pump attendant
- District level, Spare Part Store and Water Technician of MAJI
- Regional level, Central Spare Part Store and Regional Maintenance Officer (Ibid.).

New shallow well attendants have been trained with three different systems: on-the-job training with the mobile maintenance unit, one

week intensive training course for a larger group of pump-attendants from several villages and on-the-job training with well construction and installation groups. The two first mentioned systems have been used for villages where the shallow wells have been previously constructed and the third system used for those villages which have been more recently under construction (Progress Report 1.7.-30.9.1983).

In addition to the above training methods, an agreement with the Regional Educational Officer of Lindi had been made in order to begin a pump attendant training in the Mkowe School of Village Craftsmen. All the trainees in the school would attend the pump attendant course. The duration of the training would be one month and it would take place in the Finnwater project (Progress Report 1.4.-30.6.1983).

Experience gained from the training.

Pilot programmes for village level training started in the Libobe Village. Training took place simultaneously with shallow well construction. Four men were chosen for the training. Later on one was rejected by the villagers because "he was not willing to work free for the village". One of those chosen was not around when the training started.

Until the end of 1983 only one woman was planned to be trained using the previous method, although it is likely to be the best method for women to participate. According to the Training Officer of Finnwater this is mainly due to the fact that the villagers have been reluctant to select women as pump attendants. A common argument against choosing women has been that women do not understand technical things. Usually the trainees are chosen from those villagers who already have some experience in repairing bicycles or other machines. Women usually have not done this kind of jobs before so they are automatically excluded. Another argument against choosing women has been that women are too weak for the job. But women are not considered to be too weak for carrying 20 liters of water on their heads for several hours (Training material, Annex 12-13).

The Assisting Training Officer of Finnwater took a stand that more effective military drill type of training was necessary. Together with

the Training Engineer he had arranged intensive courses of one week for about 30 trainees at a time. The trainees got a good practical experience by dismantling and putting together the parts of a pump many times during the course. This type of training might be effective but not so suitable for women since it is more difficult for them to leave the village for a whole week. Anyway one woman has attended the course and did not have any difficulties there. She applied herself to the training when the chance was given to her. No women have taken part in the on-the-job training with the maintenance group.

According to the pump-attendants the courses have been good but more training was expected. During the courses daily allowances were considered to be very important. Some attendant got a small salary from the village when they were repairing a well but not all of them were paid. Some pump attendants did not have tools for repairing the wells in the villages. Transport was a problem also since the spare part stores were far from the villages. During this study there were five spare part stores which were in Mtwara, Masasi, Nachingwea, Nanganga and Kilwa. One was planned to be placed in Lindi town.

A well is repaired

4.2. Community Development Component in the Project

4.2.1. Participation of the Villagers in the Project

Concern for the maintenance of the wells has lead to calls for increased community participation. Fear of the breakdown of the water supply is common. The root cause for most of the failures in rural water development programmes has been lack of involvement of the villagers from the very beginning.

In the Progress Report for the time 1.4.-30.6.1983 it is mentioned: "It is important to incorporate the villagers in the early stages of construction already." The villagers' ownership of the water system is emphasized also as well as their responsibility for the maintenance of the water supply system. In the Proposal for the Training Programme it is said: "The most important thing when introducing improved water supply in the village is to prepare the villagers for self-reliant action."

The increased awareness of the importance of community participation has lead to the inclusion of a community participation component in the project. The popular involvement has long been an officially accepted Tanzanian policy. It is regarded as an instrumental aspect in every designed developmental project whose immediate beneficiaries are the rural population (Mogella 1981, 77). In the process of planning the implementation of the water development objectives, it has become increasingly clear that the promotion of community participation deserves further emphasis and that the concept must be given more precise content, adapted to current development conditions (WMPCU 1982, 21). Success of community participation largely depends on community mobilization which needs a lot of background work, continuous follow-up and a promoter who is technically competent, with talents in handling people and with the ability and facilities to communicate effectively with villagers (Kauzeni 1983, 1-2).

In the Finnwater project the community participation component has still been seen quite narrowly as a contribution of free work by the villagers for the project. If the villagers are not willing to participate it is at the risk of not having wells. According to the Well Construction

Supervisor, Finnwater has 3-4 times used the Regional Water Engineer as a negotiator but far too often the communication with the villages has been cut too soon. Also the MAJI officers still have a rather limited capacity for this kind of work. According to the Finnish Finnwater officers interviewed during this study the communication with Finnwater and MAJI has its problems also. The Finnwater and MAJI officers work separately on their own fields not much discussing with each other.

The great emphasis on effectiveness was one reason why the communication with the villagers hardly fitted into the project. There were no persons available who would have had time and capacity for long-lasting and energy-consuming discussions with the villagers. Still, later there were attempts to a more village-centered approach. There was the possibility for the villagers to make wells on a self-help basis. The initiative to this came from a village. According to Finnwater the self-help system has been working well. My experience as related in this study would warrant the interpretation to this stated opinion that as long as the work got done the system worked regardless how the actual process of self-help was managed.

The procedure to organize the villagers in respect of water supply has been to hold a village meeting before the well construction group came to the village. The items discussed at the meeting were the following:

1) health and water
2) everyday maintenance of the wells
3) village water committee
4) selection of the shallow well attendants
5) salary of pump attendants
6) mobilizing people in case of construction
7) purchase of tools

(Proposal for the Training Programme, Annex 9).

4.2.2. Health Education and Sanitation

It has been planned that the implementation of the health education programme will be done in co-operation with the Adult Education and Health Authorities. A committee where AFYA (Ministry of Health), ELIMU (Ministry of Education) and MAJI (Ministry of Water) are represented has been formed. The first seminar of divisional workers of the different ministries was held in Mtwara 4-5.7.1983 for 30 people. In the feed-back of the seminar the divisional workers pointed out that they needed more training in order to be able to train others. They also wanted to get strict orders how to act in their positions. The officers also complained about lack of money and suitable health education material.

For the Tanzanians it seemed important that the organization of the programme is well planned. The people wanted to know exactly what their duties were and how they should accomplish their tasks. The delegation of the work to the officers must be coordinated in one way or other. Until now the Tanzanian officers have produced a health education material which did not fit the Finnwater project. The task was not conceived in the same way by the Tanzanians and the Finns, which indicated that more communication is needed. The training engineer prepared an illustrated training manual which was going to be taken into use in 1984.

The success of health education was going to be measured at village level. The project had not yet reached the villages. Moreover, the sanitation programme had not yet been included in the project. Autumn 1984, Finnwater was going to start a pilot programme of sanitation in some villages but FINNIDA and Finnwater were not convinced about the need of such a programme. there were quite a lot of pit latrines in the villages although the condition of them is poor (M. Rantala). The main argument against the programme may be that Finnwater finds it very laborious and needs more capacity for it than it so far had.

4.3. Conclusions

The proportion of women in the training has been minimal. Only cleaning the surroundings of the wells, a job which to training is required, has been considered a woman's job. The higher the level of education, the fewer the women participating in it. There was one woman who had been trained as a pump attendant but no women have been trained as foremen or water-technicians.

The community development component in the project has been almost non-existent. More recetly it has been incorporated in the project as conrtibution of free work by the villagers for the project and by organizing one village meeting in the villages before the construction of the wells. Accorting to the experience gained in this study, it is not enough in order to promote self-reliant action in the village. Contrary to that, self-help wells have proved to be a good alternative when the initiative has come from the village.

There are some problems of confidence between the Finns and the Tanzanians. The Finns keep the control of the project in their hands which has the consequence that responsibility is not given to the Tanzanians.

The health education programme is still under formation and the work is unorganized. The health education seems to be necessary in order to gain profit from the water supply. No sanitation programme had been included in the project but a pilot programme was going to be started in the autumn of 1984.

Women have not been defined as a specific target group in the training. It is, however a positive thing that one women has been employed for the village work during this study.

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Ikkanen, Matti	Finnwater, Water Source Controller
Ilambuga, Christina	Newala, Community Development Officer
Ildefons, Fr.	Mtwara, St. Paul's Cathedral
Josef, Fr.	Nachinwea Mission
Kaunje, Mariamu	Kinyope, Farmer
Kiljunen, Hannu	Finnwater, Driller
Kilua, Ritha	Water Resources Institute, Dar es Salaam
Kipengele, Mr.	Milola Dispensary, Medical Assistant
Kiwanga, Rematha	Water Resources Institute, Dar es Salaam
Koda, Ms.	University of Dar es Salaam
Korhonen, Veijo	Finnwater, Well Maintenance Officer
Kurtén, Gunilla	Ministry of Foreign Affairs, Helsinki
Kyber, Maria	Finnwater, Training Officer
Kárná, Ann-Christine	FAO, Dar es Salaam
Laitilainen, Rauno	Forestry Project, Zanzibar
Lengwata, Mr.	Lindi, Planning Officer
Liveta, Ms.	Rutamba, Ward Secretary
Luc s-Oleng, Rafael	Tampere/MASI, Dar es Salaam
Manninen, Jussi	Finnwater, Construction Supervisor
Mapunga, Mr.	Mtwara, Regional Livestock Dev.Office
Matimbe, Ms.	Milola, Dispensary
Matin, Linus	Lukuledi, Pump attendant
Mavika, Mr.	Newala, Community Development Officer
Miraji, Mr.	Nachingwea, District Water Engineer
Mlapony, Frank	Kinyope, KILIMO
Mmbaji, Mr.	Kinyope, Teacher

Mohamedi, Mariam	Finnwater, Accounts Clerk
Mpaka, Ms.	Mtwara, Manpower Officer
Mpiri, Jerome	Kitangari Rural Health Centre
Mtamba, Ms.	Mtwara, Educational Officer
Mtamila, Abdalla	Finnwater, Well Construction Group
Mtotonwema, Mr.	Milola, Educational Officer
Mswahilia, Mr.	Mtopwa, Teacher
Mwenambulo, Mr.	Mtwara, District Water Engineer and Project Coordinator/Finnwater
Murphy, Oliver	World Bank, Researcher
Muurinen, Sulevi	Finnwater, Drilling Mechanic
Nabalang'anya, Amina	Mtwara, Community Development Officer
Nabuta, Mr.	Masasi, MAJI
Nalinga, Ahmadi	Finnwater, Shallow-well Maintenance Officer
Nankomwa, Hemedi	Finnwater
Nowa, Shaibu	Finnwater, Accounts Assistant
Oleng, Christina	Helsinki
Omari, Majuma	Kinyope, Farmer
Omari, Ahmadi	Ngapa, Pump attendant
Pauli, Mekitildis	Ngapa, Pump attendant
Persson, Ulla	UNICEF, Helsinki
Pilla, John	Chilala Folk Development School
Poikela, Seppo	Finnwater, Water Work Mechanic
Rajala, Antti	Finnwater, Assistant Training Officer
Ramakrishna, Mr.	Lindi, Regional Water Engineer
Rantala, Matti	Finnwater, Helsinki
Raunio, Anna-Liisa	Forestry Project, Zanzibar
Ritala, Reino	Finnwater, Construction Supervisor
Rönkkö, Esa	WMPCU, Dar es Salaam
Sayi, Mr.	Mtwara, Regional Water Engineer
Singinika, Mr.	National Museum, Dar es Salaam
Wumbura, David	Kinyope, Teacher

Acknowledgements

I would like to extend my sincere gratitude to Dr. Marja-Liisa Swantz and my fellow researchers Traute Stude, Päivi Kokkonen, Anja Toivola, Monica Böök and Taina Bertell for the inspiring discussions and their personal support in my study. In Tanzania the contribution of my fellow workers Celina Shinyambala and Jessy Nandonde was of great significance for the progres of my work.

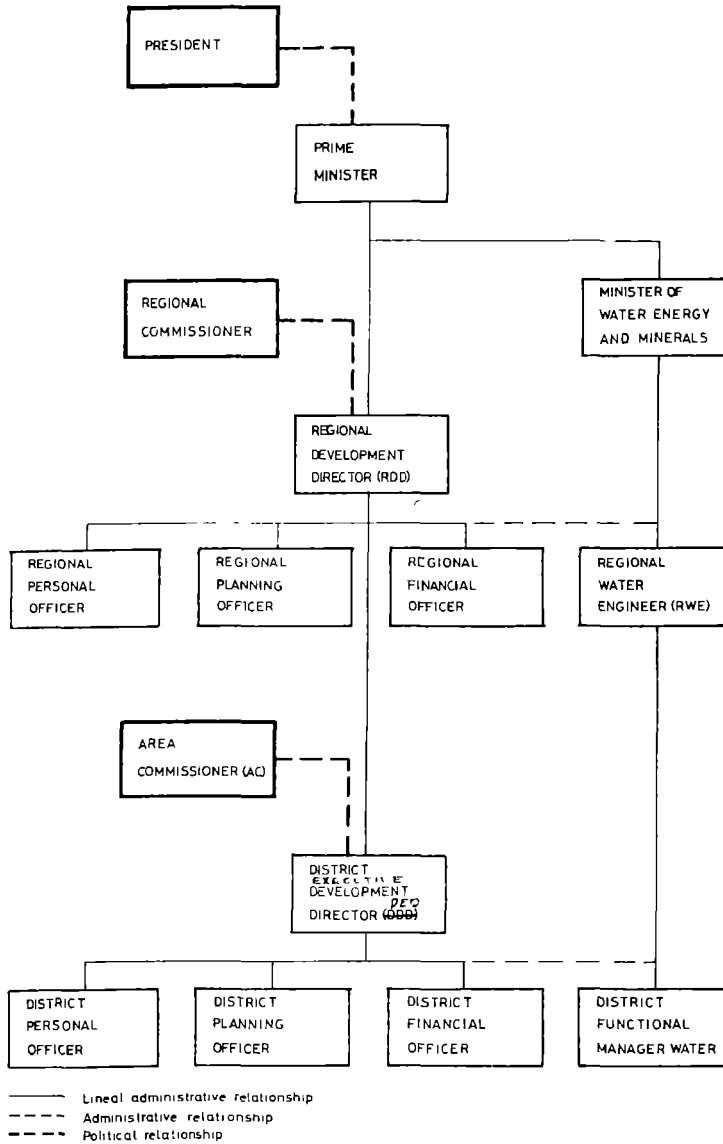
Further, I am grateful to Marja Kyber for both her co-operation and interest and for opening her home to me in Mtwara. The help that Reino Rintala gave me by lending his motor-bike to me was also especially important. I am much obliged to him and other Finnwater workers who gave their time and attention to my work as well as to Mr. Fracier-Smith for his personal assistance. Finally, I owe much to numerous Tanzanians for their friendliness, patience and hospitality during my stay in Tanzania.

Merja Kivelä
Helsinki
February 1984

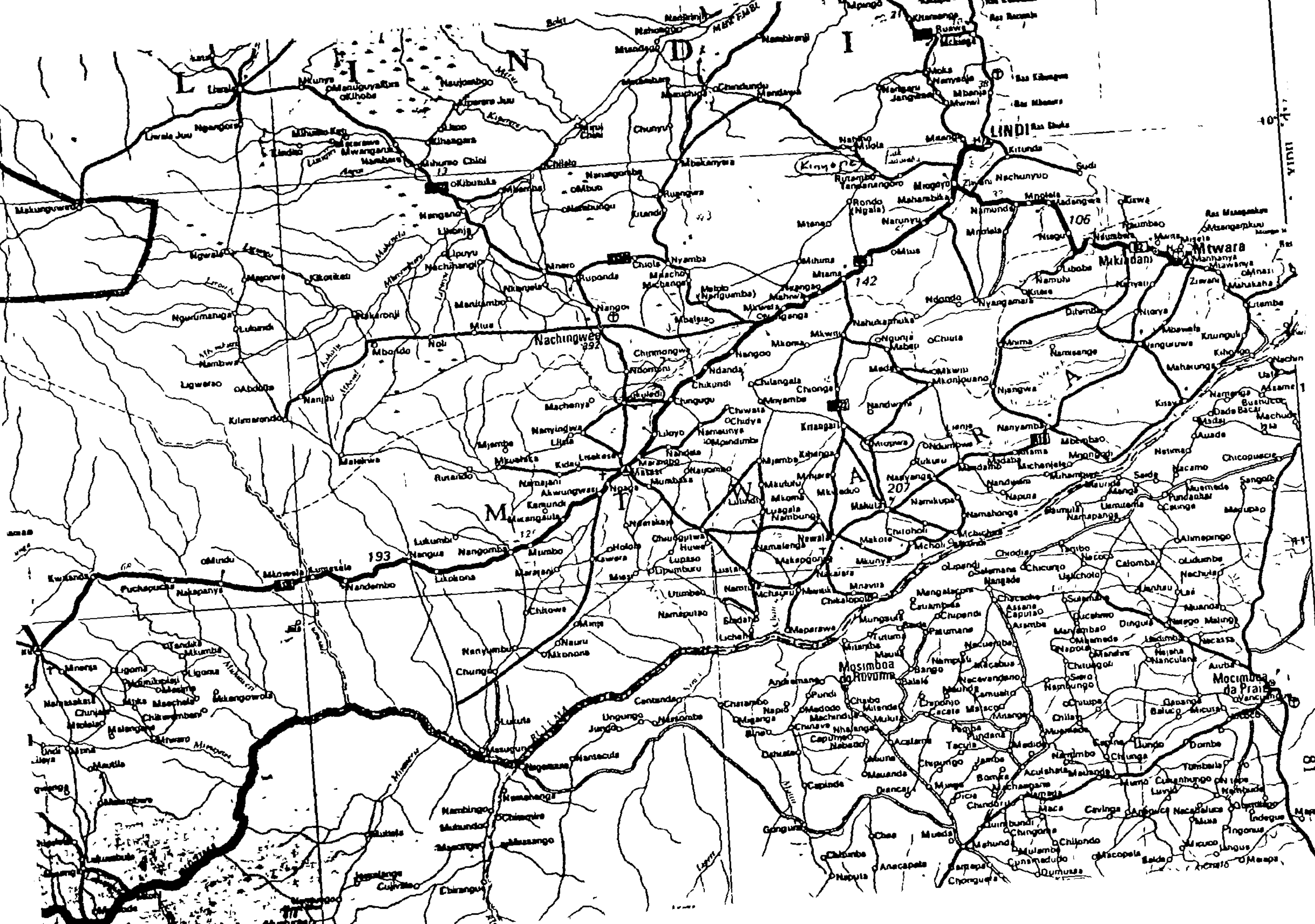
Categories of infectious diseases related to water and preventative strategies

Category	Examples	Relationship to water	Preventative strategies
Water-borne	Cholera, typhoid, dysentery, infectious hepatitis	Water acts only as a passive vehicle for the infecting agent. These diseases also depend on poor sanitation.	Improve water quality and prevent use of other unimproved sources. Improve sanitation.
Water-washed	Skin and eye diseases - trachoma, scabies - and leprosy, yaws, bacillary dysentery and hookwarm.	Lack of water and poor personal hygiene create conditions favourable to their spread. The intenstional infections also depend on poor sanitation.	Improve water quantity and water accessibility and promote better hygiene. Improve sanitation.
Water-based	Schistosomiasis and guinea worm	A necessary part of the life-cycle of the infecting agent takes place in an aquatic animal. Some are affected by poor sanitation.	Decrease need for water contact. Control snail population and improve quality of water. Improve sanitation.
Water-related	Yellow fever, malaria, sleeping sickness	Infections are spread by insects that breed in water or bite near it. Unaffected by sanitation.	Improve surface water management, destroy breeding sites and decrease need to visit breeding sites.

(Source: White, Bradley and White, 1972 and Saunders and Warford, 1976)



LINKAGE OF WATER ADMINISTRATION WITH GENERAL ADMINISTRATION



LINDI
Mtwara
Mikindani
Nachingwea
Mosimboa do Rovuma
Mocimboa da Praia
Liwale
Lihala Juu
Ngangora
Makunguwero
Mkunya
Kihobe
Naujombo
Kiperere Juu
Kihangara
Ruhuruo Chini
Kibutuka
Mbaru
Nangano
Lihonja
Lipuyu
Nachihangi
Ngwale
Majonwe
Kikokikoti
Nakaronji
Nowumanga
Lubundi
Nambwa
Ligwerao
Abdulla
Nanjiri
Kilimarondo
Matekwa
Mbondo
Noli
Mtua
Mnero
Ruponda
Chiola
Nyamba
Nangoo
Nambilanji
Chiwinje
Mandawa
Mbekanyera
Ruangwa
Kitunda
Sudi
Nachunyu
Mingoyo
Mnolela
Madangwa
Nanyamba
Kitangari
Mahuta
Newala
Makote
Namikupa
Nangomba
Mumbo
Nangua
Lukumbi
Mkowela
Nandembo
Nakapanya
Puchapucha
Kwiranda
Chikowe
Nanyumbu
Chungu
Masuguru
Negomano
Lukuta
Ungungo
Jungo
Nanyinga
Lijala
Mkwaiteka
Kidau
Masasi
Ndanda
Chiungutwa
Lupaso
Mtama
Mnazi
Ziwani
Msimbati
Mahakuha
Imbimbi
Dumbuya
Namitatari
Mangalacope
Nangade
Chipande
Muidumbe
Mueda
Chitunda
Ngapa
Olumbe
Diaca
Nairoto
Mandimba
Mungue
Chai
Macomia
Nacuale
Chiure

Relationships between water supply improvements and potential benefits

Benefits	Accessibility	Quantity	Quality	Reliability
Time-saving	Saving on the water collection journey for each household	-	-	Saving during season when unreliable sources fail
Health improvement	Water piped into homes may increase quantity used (see next column) and reduce exposure to water-based disease	Potential improvement in hygiene is additional water is used	Precludes one avenue of faecal-oral disease transmission	May avoid seasonal use of more polluted sources of water
Labour	Labour released by time-saving, and indirectly by health improvement	Indirect through health improvement	Indirect through health improvement	Seasonal time-saving
Agricultural advance	Possible indirect benefit from labour release	Surplus or waste available for gardening	-	Seasonally significant in some cases
Economic diversity	A prerequisite, but not usually a major one	A prerequisite but not usually a major one	-	Permits permanent settlement

(Source: Feachem et al, 1978)

LAND AREA, REGIONAL AND DISTRICT POPULATION AND POPULATION DENSITY

1978 POPULATION CENSUS - (TANZANIA MAINLAND)

Table C.1 (i) (continued)

REGION - DISTRICT	LAND AREA (SQ. KM)	POPULATION (NUMBER)			DENSITY PER SQ. KM.
		MALE	FEMALE	TOTAL	
COAST	32407	252736	263850	516586	16
- Bagamoyo	9042	67648	68319	135967	14
- Kisarawe	8708	109217	112955	222172	26
- Rufiji	13339	64049	71293	135342	10
- Mafia	518	11022	11283	23105	45
DAR ES SALAAM	1393	449911	393179	843090	605
- Kinondoni	527	196054	170105	366159	695
- Ilala	210	116074	102352	218426	1040
- Temeke	656	137783	120722	258505	394
LINDI	66046	257394	270230	527624	8
- Kilwa	13057	54047	59825	113872	8
- Lindi (Rural)	9302	118679	126304	244983	26
- Nachingwea	6115	51840	50211	102051	17
- Liwale	36620	18095	20511	39406	1
- Lindi (Urban)	72	13933	13379	27312	379
MTWARA	16707	373042	398776	771818	46
- Mtwara (Rural)	3683	70090	73943	144033	39
- Newala	4015	145599	161706	307305	77
- Masasi	9036	132769	139140	271909	30
- Mtwara (Urban)	73	24504	23907	48491	664
RUVUMA	63498	270106	291469	561575	9
- Tunduma	18778	64950	70585	135535	7
- Songea (Rural)	35920	86172	94410	180582	5
- Mbinga	8417	94041	102120	196161	23
- Songea (Urban)	383	24943	24354	49297	129

Source: Bureau of Statistics

Table A.4 (continued) (Sq. km)

REGION	DISTRICT	LAND AREA	WATER AREA	TOTAL AREA
MARA	Tarime	3005	7252	11137
	Musoma	1957	2352	4309
	Bunda	2782	980	3762
	Serengeti	10942	-	10942
	Total	19566	10584	30150
MBEYA	Mbeya	18519	-	18519
	Chunya	27065	1166	28231
	Mbozi	9506	386	9972
	Rungwe	2454	-	2454
	Kyela	791	518	1309
	Ileje	1935	-	1935
	Total	60350	2070	62420
MOROGORO	Morogoro	19296	-	19296
	Kilosa	14245	-	14245
	Kilombero	13577	-	13577
	Mahenge	23681	-	23681
	Total	70799	-	70799
MTWARA	Mtwara	3756	-	3756
	Newala	4015	-	4015
	Masasi	8936	-	8936
	Total	16707	-	16707
MWANZA	Mwanza	895	828	1723
	Magu	3095	1826	4921
	Kwimba	5546	-	5546
	Geita	6388	831	7219
	Sengerema	3028	6588	9616
	Ukerewe	640	5583	6223
	Total	19592	15656	35248
LINDI	Lindi	9454	-	9454
	Kilwa	13857	-	13857
	Nachingwea	6115	-	6115
	Liwale	36620	-	36620
	Total	66046	-	66046
DAR ES SALAAM	Kinondoni	527	-	527
	Ilala	210	-	210
	Temeke	656	-	656
	Total	1393	-	1393

Source: - Areas relating to Tanzania Mainland and Zanzibar Island have been estimated by Geography Department, University of Dar es Salaam.
- Areas relating to Pemba Island are as published in Zanzibar Statistical Abstract Vol. I

Annex 3.

DISTRIBUTION OF MEDICAL FACILITIES BY REGION - AS AT 31ST DECEMBER 1978

REGION	Population 1978	Total Number of Hospital Beds				Population per Bed	Total Number of Doctors (1)			Population per Doctor	Number of Dispensaries (2)	of which Parastatals	Population per Dispensary	No. of Health Centres
		Government	Voluntary Agencies	Total	of which Special Hospitals		Registered Doctors	Licenced Doctors	Total					
Dodoma	972,005	1,429	366	1,795	929	542	34	5	39	24,923	152	1	6,394	14
Arusha	926,222	458	512	970	-	955	29	15	44	21,051	142	23	6,523	11
Kilimanjaro	902,435	810	844	1,654	256	546	85	21	106	8,514	145	16	6,224	1.
Tanga	1,037,768	794	835	1,629	210	637	34	18	52	19,957	220	69	4,717	12
Morogoro	939,264	562	847	1,409	45	667	28	15	43	21,843	184	29	5,105	1?
Coast	516,586	329	118	447	-	1,156	7	6	13	39,737	100	9	5,166	6
Dar es Salaam	843,090	1,343	144	1,487	-	567	197	11	208	4,053	106	44	7,954	.
Lindi	527,623	425	292	717	-	736	15	3	18	29,312	90	4	5,304	7
Mtwara	771,817	669	387	1,056	142	731	23	3	26	29,685	96	1	8,040	7
Ruvuma	561,576	241	973	1,214	-	463	24	3	27	20,799	94	-	5,974	9
Iringa	925,043	436	926	1,362	-	679	22	10	32	28,908	161	3	5,746	12
Mbeya	1,079,866	579	705	1,284	36	841	25	15	40	26,997	136	3	7,940	12
Singida	613,949	344	434	778	-	789	15	9	24	25,581	84	-	7,309	6
Tabora	817,906	611	431	1,042	-	785	22	9	31	26,384	106	1	7,716	
Rukwa	451,894	245	45	290	-	1,558	7	4	11	41,081	72	2	6,276	6
Kigoma	648,940	325	215	540	-	1,202	13	4	17	38,173	88	1	7,374	7
Shinyanga	1,323,535	585	318	903	-	1,466	10	8	26	50,905	153	4	8,651	14
Kagera	1,009,767	341	1,255	1,596	41	633	14	6	20	50,488	124	3	8,143	17
Mwanza	1,443,379	917	643	1,560	-	925	52	9	61	23,662	188	6	7,670	19
Mara	723,829	370	288	658	-	1,100	20	2	22	32,901	100	5	6,702	11
Total	17,036,498	11,813	10,578	22,391	1,659	761	684	176	860	19,810	2,557	224	6,663	202

Source: Ministry of Health

(1): Only those attached to civilian medical institutions

(2): Including 352 parastatals and private dispensaries

LITERATE MALES AGED 10 YEARS OR MORE AS A PERCENTAGE OF TOTAL MALES OF THAT AGE BY REGION - 1978 POPULATION CENSUS

Table C.5.2 (i) (%)

REGION	TOTAL	LITERATE	NOT LITERATE	N.E.S.
Dodoma	100	62	38	0
Arusha	100	51	49	0
Kilimanjaro	100	81	19	0
Tanga	100	74	26	0
Morogoro	100	72	28	0
Coast	100	60	40	0
Dar es Salaam	100	84	16	0
Lindi	100	64	36	0
Mtwara	100	65	35	0
Ruvuma	100	79	21	0
Iringa	100	70	30	0
Mbeya	100	65	35	0
Singida	100	60	40	0
Tabora	100	54	46	0
Rukwa	100	66	34	0
Kigoma	100	60	40	0
Shinyanga	100	47	53	0
Kagera	100	66	34	0
Mwanza	100	59	41	0
Mara	100	73	27	0
MAINLAND TOTAL	100	65	35	0
Zanzibar North	100	42	58	0
Zanzibar Central	100	62	38	0
Zanzibar West	100	74	26	0
Pemba North	100	49	51	0
Pemba South	100	53	47	0
ZANZIBAR TOTAL	100	58	42	0
TANZANIA TOTAL	100	65	35	0

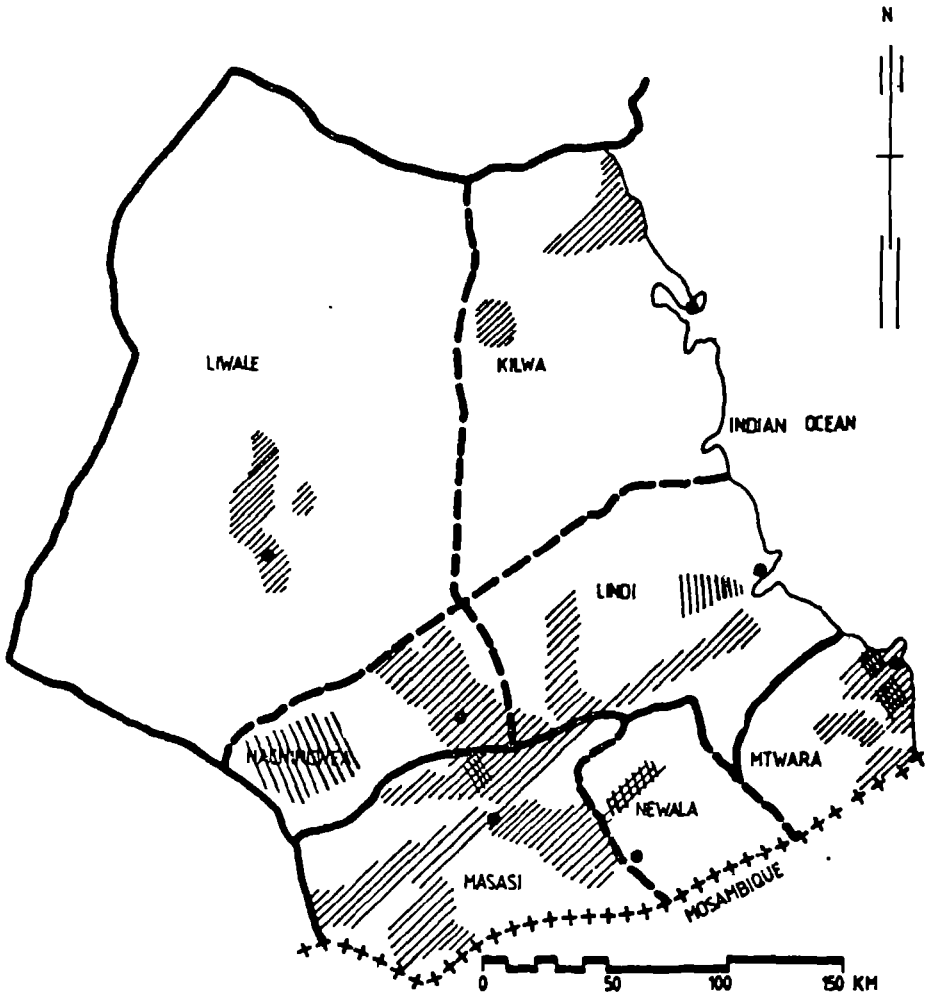
Source: Bureau of Statistics

LITERATE FEMALES AGED 10 YEARS OR MORE AS A PERCENTAGE OF TOTAL FEMALES OF THAT AGE BY REGION - 1978 POPULATION CENSUS

Table C.5.2 (ii) (%)

REGION	TOTAL	LITERATE	NOT LITERATE	N.E.S.
Dodoma	100	38	62	0
Arusha	100	32	68	0
Kilimanjaro	100	67	33	-
Tanga	100	48	52	0
Morogoro	100	45	55	0
Coast	100	29	71	0
Dar es Salaam	100	60	40	0
Lindi	100	34	66	0
Mtwara	100	39	61	0
Ruvuma	100	55	45	0
Iringa	100	41	59	0
Mbeya	100	35	65	0
Singida	100	35	65	0
Tabora	100	27	73	0
Rukwa	100	31	69	0
Kigoma	100	30	70	0
Shinyanga	100	20	80	0
Kagera	100	42	58	0
Mwanza	100	30	70	0
Mara	100	42	58	0
MAINLAND TOTAL	100	39	61	0
Zanzibar North	100	20	80	-
Zanzibar Central	100	41	59	-
Zanzibar West	100	53	47	0
Pemba North	100	23	77	-
Pemba South	100	28	72	0
ZANZIBAR TOTAL	100	35	65	0
TANZANIA TOTAL	100	39	61	0

Source: Bureau of Statistics



++++++ INTERNATIONAL BOUNDARAY

REGIONAL BOUNDARY

DISTRICT BOUNDARY

AREA OF CONSTRUCTED WELLS PHASE I – II

AREA OF CONSTRUCTED WELLS PHASE III

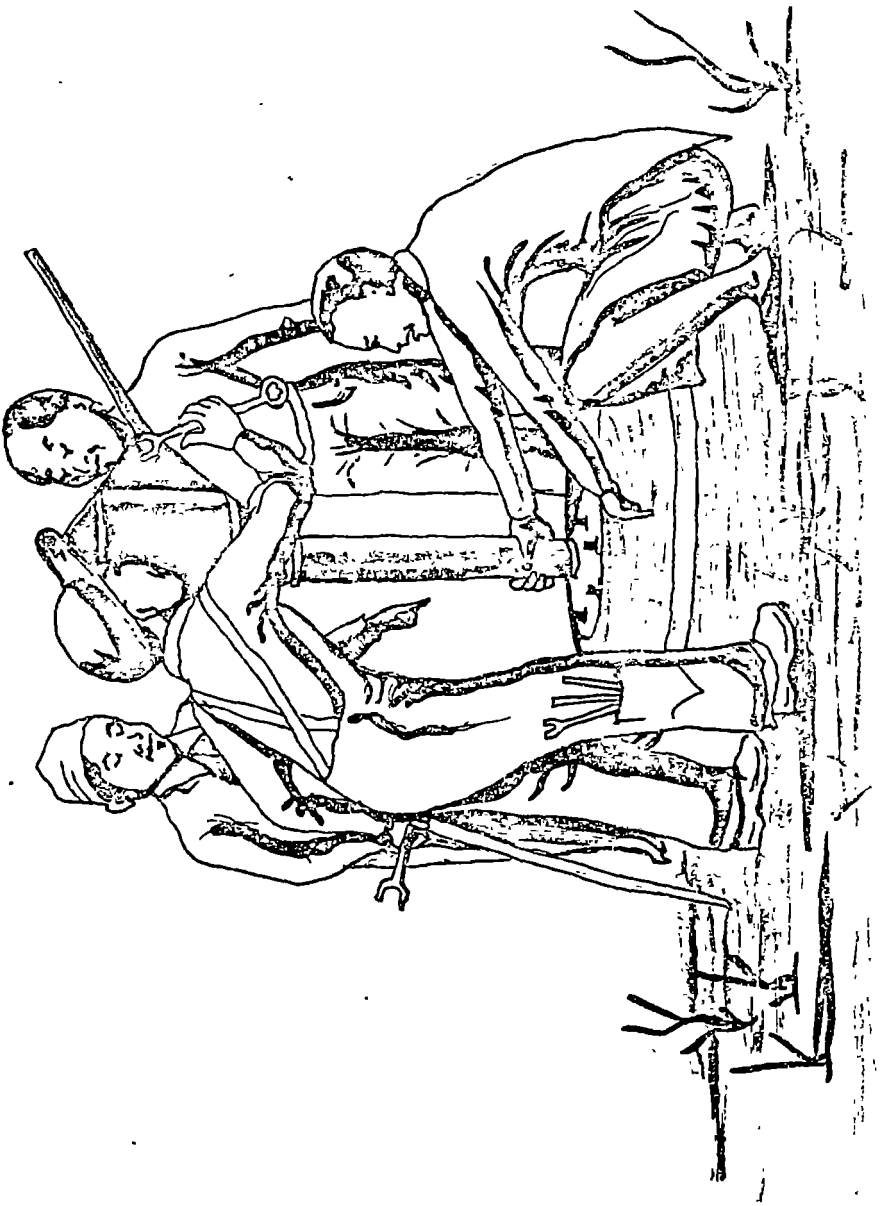
AREAS WHERE SHALLOW WELLS HAVE BEEN CONSTRUCTED.

Source: Finnwater

Annex 7.

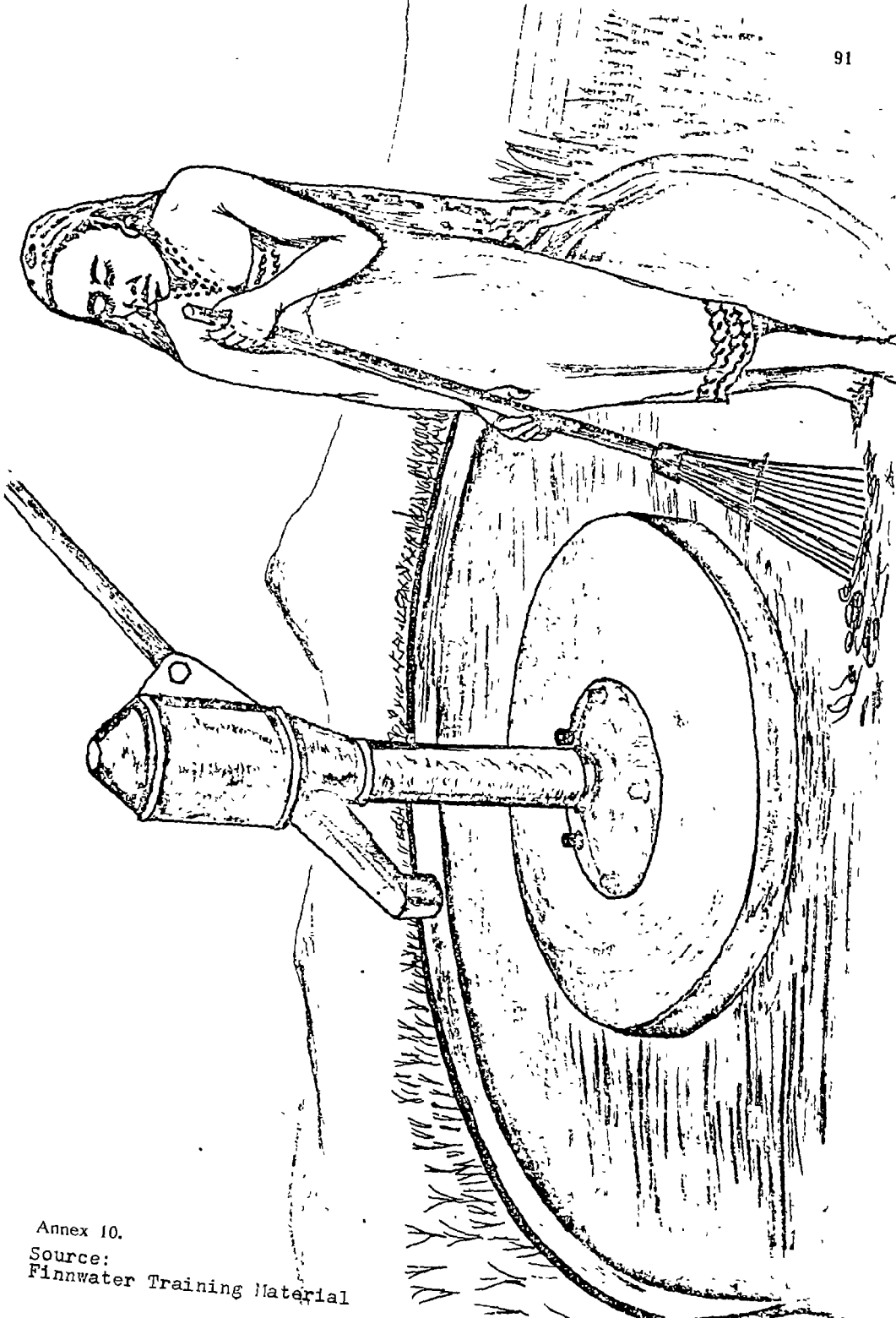
Village: _____ Number of wells: _____ Date: _____
Name: _____ Tribe: _____
Age: _____ Married: _____ Children: _____

1. When did you get the new wells? _____
2. How far is the nearest well from your house? _____
3. Where did you take water before you got the new well? _____
   a) during wet seasions _____ b) during dry seasions _____
4. What was the distance to the old well? _____
5. Did the people of the village participate in the building of the wells?
   How? _____
6. Do people from other villages use the well? _____
7. How many ours per day do you spend on collecting water at this time? _____
8. How many ours did you spend on collecting water before the new well? _____
9. Do you use now more water than before? _____
10. For which purposes do you use water most? _____
11. If you now use less time on collecting water than before: what do you do instead of fetching water? _____
12. Has someone informed you how to use the new well? _____
    Who? _____
13. How was the place of the new well decided? _____
14. Is there enough water in the new well during the whole year? _____
15. Where do you take water if the well is dry? _____
16. What is the quality of the water in the new well? _____
    a) taste _____ b) smell _____ c) colour _____
17. What is the quality of the water in the old well? _____
    a) taste _____ b) smell _____ c) colour _____
18. What are the most common diseases in this village? _____
19. What kind of diseases have you had during the last year? _____
20. Do people wash their clothes on the well? _____
21. Is the surrounding of the well clean? _____
22. Has the well been broken? _____ How many times? _____
23. What was the reason for that? _____
24. Who repaired the well? _____
25. Have you ever seen someone damaging the well? _____
26. Is there any person in the village who is taking care of the well? _____
27. How was she/he chosen to that job? _____
28. Does she/he get a salary for that job?
29. Are there any rules how to use the well? Which? _____
30. Do you use water for livestock? _____
31. Do you use water for gardening? _____
32. What kind of crops do you grow? _____
33. What kind of development programs do you have in this village?
34. What do you usually do when you have sparetime? _____
35. Are there any women in the villagecouncil? _____
36. Do you attend in any adult education or women's groups? _____
37. Are you member in any co-operative societies? _____
    _____ LCM _____ UWT _____
38. How would you like to improve the water-situation in this village?
39. How would you like to improve women's conditions in this village?
40. Other comments P.T.O.. _____



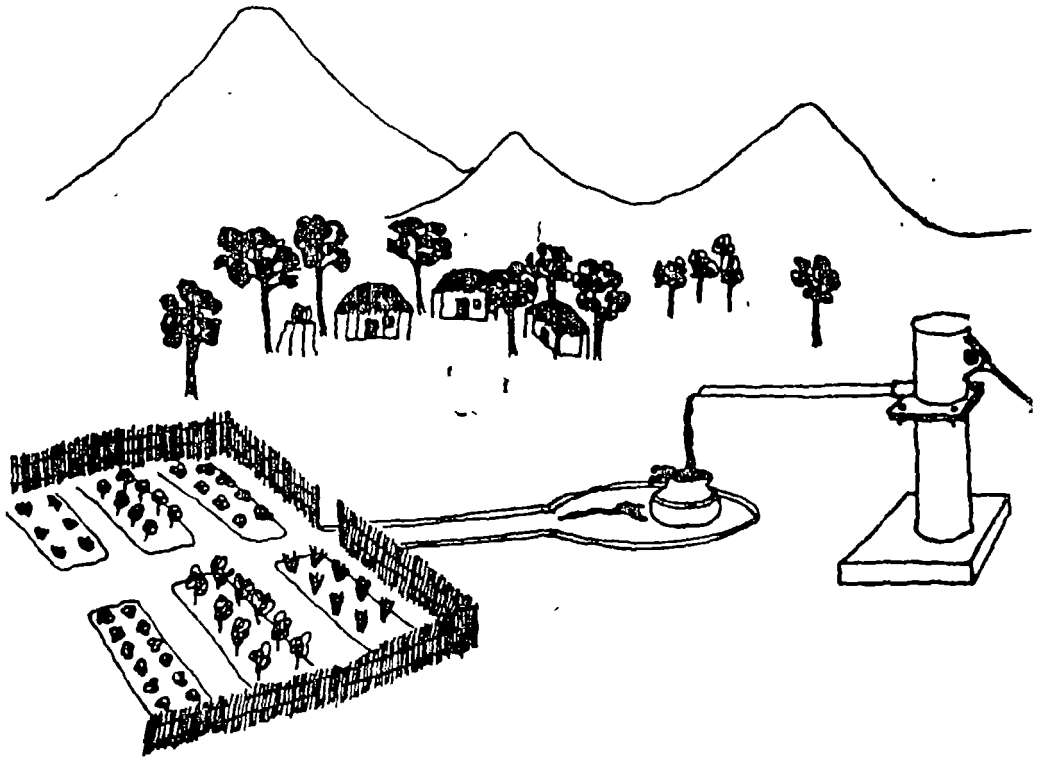
Source:
Finnwater Training Material

Annex 9.



Annex 10.

Source:
Finnwater Training Material



Channel drain water into a garden

Source: Trainers Guide for Village level Maintenance of Malawi Handpumps

Annex 11.

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The following reports have been published within the project on Effects of Finnish Development Cooperation on Tanzanian Women:

1 1985 Swantz, Marja-Liisa, Concluding Report.

2 1985 Kokkonen, Päivi, Finnish Aid to the Tanzanian Health Sector, A Study of the Training of Rural Medical Aids and the Health of Women.

3 1985 Stude, Traute, Finnish Aid to Tanzanian Agriculture: The Case of Uyole Agricultural Centre (UAC) 1973—1982.

4 1985 Toivola, Anja, Women in Development: The Case of Finnish Aid to Tanzania.

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6 1985 Böök, Monica, The Urban Women's Situation in Tanzania.

7 1985 Kivelä, Merja, Women and Water Technology; The Case of the Finnish Water Project in Tanzania.

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