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THE UNIVERSITY OF DAR ES SALAAM
DEPARTMENT OF SOCIOLOGY

THE IMPACT OF DOMESTIC WATER SUPPLY PROJECTS ON RURAL
POPULATION AND THEIR ROLE IN PRODUCTION AND
REPRODUCTION IN DODOMA RURAL DISTRICT

BY

M.W. KIRIMBAI

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DECLARATION

The undersigned hereby declares that this dissertation is her original work and has not been submitted for a degree in any other University.

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ABSTRACT

This study was set to understand the significance of rural water projects in relation to production and reproduction among agro - pastoralist small holders, the Wagogo of Dodoma Rural District. Special attention was directed to the role of water projects in relation to domestic labour time schedules among women.

In order to study the processes involved (e.i. the relation between water projects and production and reproduction), it was found important to analyse the peasant household as a unit of production and its relation to the wider economy. The whole argument is centered on viewing the peasantry as consisting of different strata with particular economic and social positions.

Methodologically, it was found necessary to compare and contrast the activities of two rural communities. One community with a modern water supply system and the other without. The data for this analysis was collected through questionnaire and participatory observation of peasant daily activities in these communities.

It has been possible to establish that though water projects have a significant role to play in peasant production and reproduction, they do not necessarily



address the root causes of underdevelopment in rural areas. Norms and traditions, especially those related to sexual division of labour, seem to play a greater role in rural life.

On the other hand it was established that labour is a constraining factor in peasant production. This has been shown by the fact that within the poor stratum of the peasantry, the subsistence level is hardly reached because of labour constraints, while in the rich peasant stratum especially among beer brewers, surplus is realized through using family and/or hired labour. In the middle peasant stratum a higher subsistence level is realized by directing family labour towards different activities.

The study then recommends more research to be done on the relation between water supply projects and peasant production and reproduction in different locations and during different seasons of the year, so that this aspect of rural transformation could better be understood.



In conclusion, several suggestions are made to water projects planners and implimenters. Such suggestions include the participation of the local population in decision making as to how best such projects should operate. Secondly, facilities of water for livestock production should be made available. Lastly, domestic water points should be evenly distributed all over the villages and, where possible, the distance to the water points should be reduced.



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CHAPTER I

1.

I N T R O D U C T I O N

In order to accelerate rural development, including improving living conditions for the rural population, the Tanzanian Government took a major policy decision in 1971, namely that of providing clean water supply to the rural areas so that by 1991 all Tanzanians will have easy access to domestic water point. "Easy Access" has officially been interpreted as a distance of about 400 meters and a quantity of 30 liters of water per person per day. These efforts are in line with the country's development strategy which is rural inclined and man centered. For this programme an investment cost of between 12 to 18 billion shillings was then estimated, a cost which must have gone much higher by now as the cost of living has risen tremendously.

The Tanzanian programme of providing rural population with clean water has come to coincide with the International Drinking Water Supply and Sanitation Decade (IDWSSD) declared for 1981 - 1990 (See UN Report 1976 a) Under the IDWSSD programme, local communities at National level are to be educated to create awareness of safe water and proper sanitation, enabling the people to assume responsibility in deciding on their lives. The IDWSSD programme also requires the training to of national personnel/plan, build and maintain water supply projects. Nations should also induce, adopt and develop technology for tapping, pumping, storing, purifying and



delivering water to the population concerned. This programme will obviously accelerate the Tanzanian National Water Supply Programme.

In Rural Tanzania, the logical move from scattering of population to a community living in Ujamaa Villages has a number of advantages, not least of which is the provision of good water supply at least sufficient for domestic purposes. It also enables many other activities and aids to be provided on a collective basis such as primary schools, dispensaries, a post office, dukas, local markets etc. But perhaps most important of all is the possibility of organizing production on a more modern and productive basis even within the severe constraints imposed by soil and climate.

Dodoma Rural District being one of the major pastoral areas in Tanzania, development of rural water supply is intended to provide water for livestock as well.

II. Statement of Problem.

This study is designed to understand the role played by Domestic Water Supply Projects on production and reproduction among the agro-pastoralist small holders, the Wagogo in Dodoma Rural District. Special emphasis is to be directed on the aspect of domestic labour among women.



Dodoma Rural District of Dodoma Region is chosen to be the area of the study, not only because little sociological study relating to the evaluation of water projects on production or reproduction has been done, but also because it is an area where water availability is very much limited due to both climatic and ecological conditions. This problem of water availability has been crystallized by moving people together under villagization programme in the district making the traditional water source inadequate. This necessitates the inhabitants especially women to spend a major portion of the day walking long distances, sometimes up to 8 kilometers to get their required quantity of water, wasting a lot of time which could be used for productive purposes.

Time and inconvenience are not only the disadvantages of long water collecting journey made by women in Rural Tanzania or Africa for that matter. It has been estimated that it takes up to 12% of day-time calories expended for water carrying in non dry- areas. And in dry areas like Dodoma Rural District energy needed in collecting water may take up to 25% or more of the day-time calories expended (Clayve 1974). Women are traditionally not the most well nourished members of the household, the most nutritious food being normally reserved for men. Therefore, it is of paramount importance when evaluating the impact of Domestic



Water Supply Projects in Rural Areas to bare in mind the special problems affecting women.

The above point can be stressed by referring to the Dodoma Regional Water Master Plan. According to this plan, rural inhabitants in the whole region depend for their domestic water requirement on rivers, springs water holes and sandy river beds. Springs and rivers are sources of water for very restricted areas in Kondoa and Mpwapwa Districts. As such a major portion of the Region including Dodoma Rural District depends on water holes and river beds which give very limited yields especially during the dry season.

Since 1970 efforts have been made to supply the rural population in the region with adequate and potable water supply for both human and livestock consumption.

The efforts are reflected in the amount of money which has been allocated to the development of water supply in the region, since 1970 when the programme for resettling people in villages commenced under Operation Dodoma. For example (RDD's Office Dodoma) financial report shows that out of 12 million shillings which was budgeted for Regional Development projects during the financial year 1972/75, 8 million shillings (about 66%) of the total budget was



allocated to Water Development Projects. Again in 1973/74 financial year 60% or a total of 6.5 million shillings budgeted for development went to water development. Since then a considerable amount of money is still being invested in water projects to supply the rural population with clean water.

If large amounts of money are to be invested in any programme, one naturally wants to know what benefit the people derive from these expenditures. As has been shown before, the aim of supplying clean water to the rural population is to improve living conditions, to enable people to be more productive and healthier. Hence a research of this nature i.e. the impact of Domestic Water Supply on rural population with special emphasis on women's domestic labour time schedule, is an essential aspect of investigations on water projects.

III. Background Research on Water Supply Projects

A number of research projects have been conducted to probe the different aspects of improved water supply. Research of an economic, social and public health nature, has been conducted in different parts of East Africa and Tanzania in particular. For example the work of White, Bradley and White (1972), Saunders and Warford (1976)



Beachen, MacGarry and Mera (1977) and Beachen et al (1978) and many others. It is true that a considerable amount of insight has been obtained, but many of the questions have not yet been conclusively answered. For example, it has been proved difficult to identify which health charges have occurred as a result of introducing rural water supply. The availability and reliability of health statistics are as a rule, so poor that they do not give a good indication of whether people are in great need of an improved water supply from a health point of view. Then what are the benefits of improved water supply? Or what are the factors determining the patterns of water consumption? Or is there any relative importance of any water supply projects without intergrating these projects with other basic services such as health, education, nutrition etc? Even with integration of the water projects with other basic services, is it possible to find out whether people will use more water, be more productive be healthier? Will water projects have any significant effect on women's domestic labour time schedule? To these and other similar questions, only partial answers have been given. For example, though it has been proved that water could readily be available when the water supply project is brought to the community, it depends on the system being in a good working condition. This point has been shown by Mujwahuzi (1978) in his survey of Rural Water Supply Projects



in Dodoma Rural District. He found out that 22 projects out of 31 projects he surveyed were not in working conditions. From the above findings one could generalize that water supply projects in Dodoma Rural District do not have much effect on people's health as they are forced to resort to their traditional sources. On the other hand no energy or time would be saved in carrying water for the domestic requirements. So the situation may remain unchanged. Bradley et al (1973) have pointed out that women in dry parts of East Africa are spending up to 5 hours every day collecting one trip of family water requirements.

On the sociological aspect of water supply, studies have mainly concentrated on water consumption aspects. For example.

(i) D. Warner 1970's survey of 9 villages in three districts of Tanzania (Kilimanjaro, Morogoro and Pare), with a sample ranging from 8 - 33 households per village, found out an overall average of 4.3 liters consumption per capita per day in Pare District, 9 liters in Kilimanjaro and 13.2 liters in Morogoro or an overall average consumption of 8.6 liters in the whole study area.



(ii) C. Ferster 1970 calculated the per capita water consumption in 11 villages in Nzega District. His findings ranged from 3.5 - 20 liters per capita per day with an average daily consumption of 12.6 liters per capita per day.

(iii) White, Bradly and White 1972 collected data on water consumption from 19 villages in Kenya and Tanzania. The consumption ranged from 4.4 - 20.8 liters of water per capita per day with an average of 11.8 liters of water per capita per day.

Obviously different factors have an effect on the per capita water consumption. One such factor which has not been considered by the above studies is the size, age and sex composition of the household studied. Other factors include the availability of water and the distance between the supply point and the household, as well as labour constraints consisting of other activities of the person who usually draws the water. Another factor is the container one uses for drawing water. For example, if the container is small then more journeys to the water point are needed and so on.

On the health aspect of water supply projects, as has been touched before in this chapter, the picture does not look so bright. Already by 1970, it was found out that



the quality of water is not always as good as one would expect from improved supplies. Analysis of the bacteriological content of water sources by Balash - Jalon Consultants Engineers Ltd. of Haifa Israel in Dodoma Region, in the process of drawing Dodoma Region Water Master Plan, showed that the content depended on the type of source. For example when the source is a borehole and ring wells, faecal coliforms were absent or very rare. However, when the source is a reservoir, rivers or inadequately protected wells, faecal coliforms count went up to 4,000 per ml of water.

In Dodoma Rural District where most of the water supply projects are tapped from boreholes, one would expect that the health hazards would be minimal. But do all people get their water from improved sources? If there is an unimproved source 100 meters away, and an improved source let us say 700 meters away, people are likely to go to the nearer source. On the other hand, to improve people's health by providing wholesome water, one would expect to find projects which are designed with a view to minimizing chances of contamination. But this is not what Mujwahuzi (1978) found in the District. Seventeen projects out of 31 projects he visited had no collection storage tanks where water could be safely stored. Instead he found that water was being pumped into ground level pools which became highly polluted. Yet he observed that people were



drawing water for their domestic consumption from these polluted pools because, as he pointed out, they did not have alternative sources.

Water recontamination do not take place only when water is pumped into ground level pools. Recontamination may occur between the Domestic water points and when water is actually consumed. This recontamination may take place through unclean containers used for both drawing and storing water. Personal hygien is also important. One's hands should be clean before she/he handle water for the household consumption etc. Much as the above facts could fulfill the objective of non recontamination of water. I feel that the aspect of boiling water, especially drinking water is vital even if the water source is safe.

On the economic aspect people have usually urged that time and energy served by using improved water supplies would be put to more productive activities both in the household as well as in communal work in the villages. But it has been difficult to show through any research that such an assumption works at all. Those who think that rural water supply projects will automatically improve economic production completely over look how complex village life is. Different activities have their own labour time



requirements, and are seasonally determined. There is no automatic relationship that time saved on one activity is automatically transferred to another activity. Rather, time and energy saved would be absorbed in a diffuse way in various activities. For example in the case of rural women, the time and energy saved from drawing water as a result of bringing water project to a village, will be absorbed in both agricultural production, household maintenance or leisure time activity.

IV OBJECTIVE OF THE STUDY.

The objective of this study is to help us to establish the significance of water supply projects in relation to water availability production and reproduction and women's domestic labour time schedule, to be explored with peasants in both Kigwe and Segu Nala Villages, in Dodoma Rural District. The study will also help to establish an explanation for the relationship between those projects and the patterns of production and reproduction in the study area, and their effect on women's work. And thirdly to establish peasants' perceptions of the benefit of water supply projects.

The following tasks are therefore set:-

- (i) To examine the real potential of increasing production both at household level as well as village level in relation to water supply.



- (ii) To examine the patterns of work schedule among household members especially in relation to water drawing and production activities.
- (iii) To examine water drawing in relation to other activities among the peasant women, especially activities like cooking, cleaning, child care, and firewood collection.
- (iv) To find out whether the Government Programme of primary health education broadcast over Radio Tanzania has any effect on water handling especially drinking water.
- (v) In light of the above findings the study then intends to make recommendation for implementation of the Rural Water Supply in the two villages and some tentative recommendations for the whole District.

V. THE SIGNIFICANCE OF THE RESEARCH.

- (i) By providing a detailed account of the relationship between rural water supply projects and the role of peasant economic logic and the patterns of surplus production on daily basis as well as generationally, we will contribute to a clearer understanding of such processes in Dodoma Rural District. This topic has received comparatively little attention in the literature.



- (ii) To try to contribute to an understanding of the role of water supply projects on the daily work schedule of women.
- (iii) By introducing the above perspective (i.e. relationship between the service provided and the general economic development), the benefits of water projects will be more clearly understood.
- (iv) In so doing, to contribute to a refinement of the conceptual tools of sociological analysis of the role of water supply projects on production and reproduction among rural population.
- (v) Following from the above points, to provide therefore work of practical relevance both to:-
 - (a) Evaluation of the rural water supply system in the chosen village; and
 - (b) The implementation of the rural water supply in ^{the} Dodona District.

VI. HYPOTHESIS/ EXPECTATION

The provision of water supply projects does not necessarily address the root courses of problems consisting of the social relation of production both at household level and village



level and therefore may not automatically transform the rural life. It is an expectation on the other hand that water may play an active role in bringing more production on the ground, that more time and energy could be saved which in turn could be absorbed in a diffused way in various activities. It is therefore expected that:-

- (i) The water supply projects are set in such a way that the domestic water points are not more than the target set by the Government, that is a distance of 400 meters from most households.
- (ii) Since Dodoma Rural District is one of the agro-pastoralist areas in the country it is expected that the construction of rural water supplies in the district include facilities for livestock drinking, as well as facilities for livestock dipping.
- (iii) If improvement in health is achieved through water supply projects so that people are able to put more efforts/ⁱⁿ development activities, then it is expected that people will not be forced or even tempted to rely on other water sources.



- (iv) Again if water projects are to affect people's health positively, then ^I expect that people are aware of the primary health programme advocated by the government.

- (v) Moreover it is expected that with the introduction of water supply projects in the villages, per capita water use will rise.



CHAPTER II

THEORETICAL FRAMEWORK.

I. Historical Background.

Massive numbers of peasants exist in many countries of both the more developed and less developed world. In recent years, their political and economic significance has been rediscovered. This has resulted from observing the important role of peasants in political struggles since World War I as well as their low-cost contribution to the production of raw materials and reproduction of labour force used in the capitalist mode of production (Bernstain 1976 Saul and Wood 1968 and Von Werlhof).

The term peasants is more relevant in the underdeveloped than in the developed world. While the peasants form the majority group in the former, they are insignificant in the latter. There is no precise definition of this term but one that is given by Saul and Wood (1968) seems to be more appropriate. They said that peasants are

"those whose ultimate security and subsistence lies in their having certain rights in land and in the labour of family members but who are involved, through rights and obligation, in a wider economic system which includes the participation of non peasants" (Saul and Wood 1971 pp. 105 in Shanir 1971)



The definition includes the pastoralists, because as the two writers noted somewhere else in their article, the pastoralists are also subjected to the same political and economic forces as cultivators. They depend on the family herds and family labour in the same way as the cultivating peasants do. In this case cultivating and pastoral peasants experience similar problems.

But what Saul and Woods have overlooked is that in the 20th Century, dependence of peasants on land for their security and subsistence is impossible. Peasants need capital to replace their farm implements, they need fertilizers to produce enough to live on and possibly a surplus for sale so that other household necessities could be bought. Peasants may be forced by circumstances to find other means of income to supplement their own subsistence production. With the above points we come to contradict Saul and Woods' notion that "peasants ultimate security lies in their having certain rights on land." We can say that despite the peasants possessing land, this does not provide them with subsistence needs as well as basic consumption needs. On the other hand, the incorporation of the peasantry into the capitalist market relations of cash crop production through colonialism has worsened the situation of the peasants, it has become more and more impossible for the peasants to satisfy their basic needs, or their consumption needs. (Mtilinyi 1980)



The consequence noted above has been an explosion of both research and programmes oriented towards the peasant question. Research has sought to observe, describe and understand the economic and political logic of the peasants, as well as their changing position and functions in broader society. Thus programmes to increase the productivity of labour in peasant cultivation, frequently in the context of search for new technologies adequate for peasant farming or the design for rural and community development projects have been carried out.

On the whole the research efforts have demystified many of the concepts that had dominated much of the early work on peasants. Such concepts include cultural traditionalism or economic backwardness of subsistence production. Yet absence of a theoretical framework for the study of the peasantry that is simultaneously integral, dynamic and operational for empirical purposes has too often prevented these studies from isolating the key factors required for analysis, and from organizing the empirical information in terms of the central processes. This would necessitate an analysis not only of the peasant household but also the forms of integration of the peasantry into the wider economy.



The purpose of this chapter is to develop a theoretical framework for the analysis of the peasants that goes beyond these conceptualizations and to apply it to the observation of the role of domestic water supply projects on the agro-pastoralist small holders in Dodoma Rural District of Dodoma Region. Collecting and classifying observation on peasants according to this framework helps account for the enormous variety in the material conditions of the peasants and for the dynamic of their transformation.

The main part of the chapter intends to discuss the present position of peasants in Tanzania and their actual and potential role in transforming the rural economy. In order to look into these issues, we will consider first the organization of the peasant household. Secondly, we will discuss the peasantry within capitalist World economy. Then we will try to place peasants in the context of the class structure of Tanzania. A discussion of sexual division of labour and the effect of modernization e.g. water supply, agricultural innovation etc. will follow. In the last part of the chapter a reflection of the above issues on the agro-pastoralists small holder in Dodoma Rural District will be considered.

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(i) Organization of Peasant Household.

The central process that characterizes any household is the production of its members over time both on a daily basis as well as generationally (Meillasson 1972). What distinguishes the peasant household from most other domestic units is that it is both the unit of production of family labour power and a unit of direct production. Household labour power has to be mobilized on a daily basis to produce the means of work as well as the means of subsistence.

The dialectical nature of the peasant household is based on necessary and contradictory relations between production relations, distribution, exchange and consumption to name four interrelated processes. However production is the chief determinant factor of the other three, that is distribution, exchange and consumption.

To expand this analysis a little bit further we find that production is at the same time consumption. Two processes are at work here. At one level an individual who produces expands his/her ability in the production process. He/she is at the same time using up energy. At the other level, the tool of production, it might be a hoe a panga etc., also get consumed, i.e. it depreciates.



Like the tools of production, the raw materials used in peasant production e.g. seeds, fertilizers, manure are being consumed. We can therefore come to the conclusion that when a peasant engages in production process at the household level he/she is at the same time consuming energy and the tools as well as raw materials of production are at the same time consumed.

The second aspect of processes that exist at the household level is the consumption process which is at the same time production process at two levels of analysis. At one level, an individual must consume food in order to continue living and be able to produce more. At the other level one would find that plants consume food nutrients and minerals from the soil. In one way or another then, production consumes the natural resources and these natural resources must be replaced in order for production and consumption to continue.

Water is an essential component of production and reproduction. First one needs water to cook with, he/she needs water for personal hygiene and other household activities. Second water is an essential component that contributes to^a healthy situation of the population. Clean water contributes towards better healthy situation.



Polluted water is hazardous to people's health, especially small children, as it contributes to diarrhoea or other fecal-oral diseases which might lead to malnutrition.

Health problems (not only those resulting from water use) affect rural people in many ways. First as producers and reproducers of their household, to be ill means not able to produce, and to be healthy means an ability to produce. Health problems also affect rural women in a social way. Because as mothers and care takers of their families the health of their household members is primarily their responsibility. A sick member in the household may mean an extra burden for the women or leaving her daily activities to concentrate on caring for that person.

Thirdly, at the household level, before any products can be consumed, first it has to be distributed in various ways. Some products must be stored for later use. Some may be sold to get cash to buy other necessities at the household such as clothes, salt, sugar, cooking oil, soap etc. In this way one could say that distribution is a source of income. Several forms of distribution take specific characteristics depending on how production is being organized at the household level. These forms of distribution are e.g. surplus of subsistence crops, cash crops, animal by-products like milk, butter, ghee, hides



and skins or selling of animals like cattle, goats, or sheep.

Distribution may take a form of wages which in the case of peasant household is not, most of the time, a full proletarianised wage. In any case, wages as a form of distribution takes place where production is based on wage labour in which case production of wage labour determines distribution.

The fourth and final process of analysis is the production for exchange. This is also determined by the structure of production. In order for exchange to take place within the peasant household a certain level of production must be attained. If it is purely subsistence production then it is necessary to produce surplus so that it may be exchanged for money in the market relation. Otherwise production for exchange is purely petty commodity production or the sale of oneslabour in exchange of wage. In this sense the household must be seen within a wider economy of the society. If the relation of production is that of primitive communalism, slavery, feudalism or capitalism, then the rate of exchange among the peasant household will vary. For example the rate of exchange under capitalism is more intense than would be under let us



say feudalism, because the division of labour within the peasant household under capitalism would have to have higher production of raw materials so that the peasant household would be able to reproduce itself through both subsistence production, means of replacing the work out tools or consumed seeds, manure or fertilizers.

Exchange activities within production essentially constitutes production. For example a cash crop producer must exchange his products with money. He/she cannot continue producing the crop without selling. Exchange in this manner makes production go on. Exchange is therefore directly connected ^{with} production unless products have been directly consumed by the producer. The process by which family labour force is allocated to a range of activities requires to reproduce the peasant household's level of subsistence consumption and possibly to generate a surplus. The surplus depending on the form of integration of the household to the wider economy, may be either appropriated by a non-producing class, or captured within the peasant household, permitting an increased level of subsistence consumption of the possibility for accumulation of means of production e.g. accumulation ^{of} cattle. This accumulation may turn the peasants into rural kulaks or capitalist farmers as in the case of merchant capital. This dynamic



process of the appropriation and distribution of the surplus forms the basis for the social differentiation of the peasants.

Access to the means of production of subsistence is key to the process of social differentiation as well as to the determination of the range of activities in which peasant households may participate. Rather than conceptualizing the peasantry as a homogenous whole, I view the peasantry as pertaining to different elements of class, based on their access to the means of production. Lack of access to the means of production requires the poor strata, for example, to depend on non-agricultural activities to earn its livelihood. These other activities may be the sale of their labour or commodity production for money income.

Access to sufficient resources allows other elements of the peasantry to engage in petty commodity production, sometime specializing in cultivation production or animal raising activities. Access to sufficient means of production also allows the richer peasantry to engage in the purchase of wage labour to carry out their productive activities, providing the means for increased accumulation.

The constitution of the peasant household as a unit of production as well as of reproduction has singularly important implications for the economic and social role of



different strata of rural women. The class position of the household may influence the activities that are considered proper for women to pursue. Economic necessity on the other hand, may result in the break-down of sex roles; poor peasant women may pursue activities not deemed appropriate for rich peasant women. The possibility for accumulation among the rich peasant strata may also open up a new set of activities to women of this stratum not available to the majority of poor peasants.

In sum the organization of peasant household cannot be analyzed in isolation from the process of integrating of the household to the dominant capitalist mode of production. This is because the division of labour by sex is at once conditioned by the degree of integration of the peasant household to the labour market or to the product market as well as determined by the social valuation of men and women's work.

(ii) The Peasantry Within the Capitalist World Economy.

The main aim of the colonial domination in Tanzania and most of the to-day's under developed countries was to utilize cheap labour for the production of cash crops for export. This could only be done by the commercialization of peasant production, and because the main objective was



to exchange raw material for export cultivation was thus the main target for this process. The process which started immediately after colonial occupation by the German and later by the British in Tanzania.

This mode of production (capitalism) was imposed upon the existing pre-capitalist modes. Capitalism implanted its own mode of production in areas which it dominated, hence Tanzania was not exceptional. It did not completely destroy the pre-capitalist modes of production, but partially altered them, restructured them and incorporated them into the world capitalist system.

Historically the pre-capitalist social formation in Tanzania was not based on money economy. The peasants were mainly producing use value for self consumption and perhaps simple exchange. Long distance trade or zonal trade did take place but it was mainly exchange of one type of commodity for another. Salt or cattle could be exchanged for grain. Ivory or slaves for guns or wine etc.

With capitalist penetration all this changed. The capitalist mode of production introduced exchange relations and petty commodity production by introducing cash crop production for the world market. The peasants now began producing for sale. However the producers retained





the means of production due to the nature of the articulation of the mode of production **i.e.** the process of production remained of a pre-capitalist nature but production itself was transformed into production for sale.

Therefore with the penetration of capitalist relations of production, the primitive communalism mode of production was transformed into petty commodity production. By entering market economy the peasant became individualized. This can be explained in terms of the nature of the capitalist mode of production which is characterized by private ownership of major means of production. The labour power becomes a commodity under capitalist mode of production being exploited through the appropriation of surplus value and the labour becomes alienated together with its products.

For empirical purposes, clear specification of the peasant's economic objective function is important. Yet the dismal nature of the controversy results from its abstract and a historical nature due to the incapacity or unwillingness to specify the nature of the particular mode of production within which peasants are inserted. Once in the contrary, this specification has been made, the controversy becomes essentially trivial. Each mode of production clearly has its own ideology and economic rules which in turn condition economic behavior and economic possibilities for peasants.



In the capitalist mode of production, which is the one of interest here, the economic logic of peasants is clarified once their intermediate and unstable class position has been specified. Peasants as an intermediate and, hence heterogenous class display a continuous range of conditions from the rich peasants to the poor peasantry.

Empirically, the important issues are:

- a) The characterization of the return to capital in the home production process.
- b) The mixing of sources of income.

At the level of rich peasantry, a new full average rate of profit is obtained in the production process: Once the average rate of profit in economy is obtained, peasants become rural capitalists. At the level of poor peasantry the profit rate obtained is zero.

Capitalist accounting of the peasant economy thus reveals a deficit the full return of all factors of production cannot be insured. As Chayanov pointed out, "peasant accounting consequently cannot individualize return to factors of production. Net income is lumped as an implicit wage -- a labour product." (Kerbley 1971)



Characterized within the capitalist mode of production as an intermediate class that ranges in its elements from implicit cash crop production or petty commodity production, the economic logic of the peasantry becomes clear. If the category of profit is negated by the minimum resource base and surplus extraction, profit maximization cannot meaningfully be specified as a goal.

Appropriation of the part of the product of peasants by other social groups had been indentified as a defining characteristic of peasants by both orthodox Marxists (Marx Kautsky and Lenin) and writers who rely on the concept of exploitation within or without the Marxian framework (Wolf 1969 Thorner 1962). From an empirical standpoint, the important question is to identify the mechanism through which surplus extraction is occurring as they permit, in turn, to contrast different relations of production that peasants enter into, and hence different types of peasants. The model of the organization of the peasant household presented above can again be used for this purpose of analysis.

Empirical analysis of the mechanisms of surplus extraction is necessarily historical for they correspond to distinct relations in production. In Tanzania or most of the African countries cash crop production for the



capitalist markets in the metropolises was dominated by merchant capitalists before these countries were given independence. Peasants were indirectly forced to produce cash crops or sell their labour for cash on capitalist plantations so that they may pay the head taxes etc.

Other mechanisms of surplus extraction used by merchant capitalists in these areas was the forces on the merchant control over any marketable surplus that the peasants may produce after their subsistence needs had been met. At other times certain specified quantities of produce or animals were to be sold to meet the food requirements for the urban workers. The merchant capitalists on the other hand operated different stores and shops where peasants' families were required to purchase their non-produced necessities.

With the attainment of independence in Tanzania and other African countries in the 50s and 60s the majority of peasants were to become independent peasant producers, but with a change in the relations of production. Although in Tanzania the head tax was no longer paid and the merchant capitalists no longer controlled the circulation of commodities, as the peasantry became increasingly integrated into ^{the} product market they became more dependent on the state or petty bourgeoisie that was now



to serve as the primary providers of credit as well as petty monopolists in rural markets. In addition, the rapid integration of the peasantry/^{into} the labour market assured that low wages would become a principal source of surplus extraction as the rural areas became the storehouse of the labour reserve.

• For the rural sector at large, the continuing deterioration of the terms of trade between cultivated and manufactured products constitutes an important source of surplus transfer from third world countries to metropole countries. For exchange in Tanzania between 1973 and 1975, the terms of trade were deteriorating at the rate of 8.6% per year (Report of Board of External Trade 1976). While quantitatively the bulk of commercial agricultural suppliers are found among the upper strata of the peasantry and commercial forms in most of the third World Countries, these sectors are able to face deteriorating terms of trade only due to the plentiful supply of cheap labour available from among the poorer strata of the peasantry. The poorer strata, of course, suffer a double jeopardy, as wage workers, they receive a wage significantly less than the value of what they produce; and as consumers integrated into product market where they purchase wage goods, they are favoured with the continual deterioration of their real wage.



(iii) The Class Position of Peasants.

Having characterized the organization of the peasant household and the patterns of surplus extraction through which peasants are exploited, peasants now need to be located as a social category within the broader society of which they are a part. Doing this implies taking sides in the old debate between Bolzheviks and Populists regarding the existence or not, of a specific peasant mode of production. This debate has been actively reopened in recent years as an understanding of the future economic contribution and the political role of peasants required specifying their position in the economy and society. (Hindess and Hirst 1975)

The debate is more than rhetorical as it leads to markedly different interpretations of the economic logic of the peasants and the future of the peasantry. Perhaps more important different political strategies. For those who claim the existance of a specific peasant mode of production, peasant economic behavior is not guided by a motive of accumulation but by the objective of simple reproduction. The usual description highlights that land is held as private property by peasants on a relatively equalitarian basis since wage labour is not used and commodities are produced for sale on the market. While this mode has been developed by Marx as a theoretical abstraction





in his dialectical development of the labour theory of value those who use it as a historical reality (Amin 1974, Meillassaux 1974, Bernstein 1976) claim that it can only be observed as articulated to and dominated by other modes of production to which it is functional and surrenders a surplus. The implication however, is that this peasant mode does have a certain stability that results from its capacity of resisting internal differentiation.

There are in my opinion, two objections to the use of the peasant mode of production concept. One is that the specific form of organization that corresponds to peasant households and the existence of mechanisms of surplus extraction do not permit a peasant mode to be defined as a theoretical category: first, because a mode of production implies the specification of a determinate set of social relations and an ideological political superstructure that remain here unidentified; second because organization and extraction are not immutable but to the contrary assume a wide variety of forms that correspond to the particular social formation in which peasants are encompassed. (Kerbley 1971)



The other objection is that facts and essence are being confused regarding the observed economic condition of simple reproduction. Do peasants want simple reproduction, or is it that they cannot overcome simple reproduction due to surplus extraction that cancels accumulation? In any opinion the fact - simple reproduction - is wrongly given explanatory capacity on a behavioral basis while the essence - surplus extraction is omitted. Clearly, under feudal and primitive communalistic modes, the possibilities of accumulation and differentiation are severely reduced by the non-existence of labour and land markets. However, when these markets prevail i.e. under fully developed capitalist modes, the empirical observation of concentration of the land by some peasants and increasing proletarianization of the many whenever economic and social conditions permit retention and accumulation of a surplus is a clear contradiction of the peasant mode concept.

For those who oppose the notion of a specific peasant or simple commodity mode of production peasants are conceptualized either as a class within a given mode of production or as elements of class under capitalism (Marx and Engels 1950 vol. 1, Lenin 1924 Prechazhsky 1924). Under feudalism, the peasantry was the essential class of direct producers subject to the appropriation of their surplus labour by a nonproducing class - the lords. Under capitalism, peasants



are a transitory and differentiated class in the process of decomposition and absorption by the essential classes - proletariat and bourgeoisie of the mode of production. In an analysis of a specific social formation characterized by heterogenous relations of production, the patterns of surplus extraction are the most revealing indicators of the element of class.

As the development of capitalist social relations in cultivation progress the feudal and primitive communalism modes decompose, releasing their peasantries that enter the capitalist mode as either peasants or proletarians. Peasants in capitalist mode are in turn, a highly unstable class that differentiates following what Lenin called "farmer road to socialism". Under the force of competitive pressures and accelerated by events such as bad weather, technological change, and market fluctuation, "an insignificant minority of small producers become rich, get on in the world, and turn into bourgeois, while the overwhelming majority are either utterly ruined and become wage workers or paupers, or eternally eked out, an almost proletarian existence" (Lenin 1924):

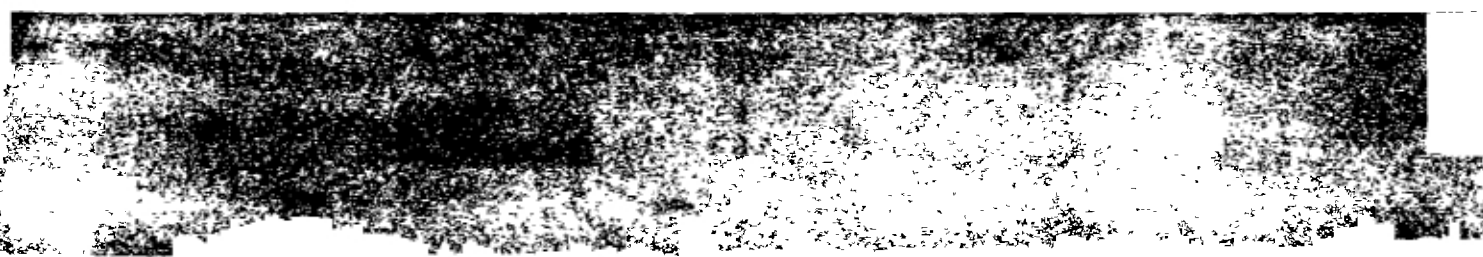
Changes over time in the level of reproduction of the means of subsistence and work, give the economic basis of differentiation. According to these levels peasants gradually



drift toward either extreme of the peasant class, eventually dropping into one of the essential classes of the capitalist mode - bourgeoisie and proletariat. Peasantry is thus only a transitory social status. Transition does not, however, imply a particular pace. Indeed this transition can last for a long time and the absolute number of peasants in the Third World still increases for a long time to come.

Among the lower strata of the peasantry, the low income level continually encourages permanent migration from the household of sons and daughters old enough to capture their own opportunity on the labour market. In many cases the deteriorating level of income attained from the combination of home production and semiproletarian work in the rural areas or in temporary migration requires the whole family to leave for the urban environment where temporary work may be easier to find notwithstanding high rates of unemployment.

Conceptualization of the peasantry within the capitalist mode of production as oscillating elements of class between proprietor and proletarian is also revealing the political position of peasants. The rich peasantry, with its petty - bourgeois character, is tied economically to the bourgeoisie and ideologically with the mass of peasants. It thus constitutes a buffer class between





bourgeoisie and proletariat in the increasingly polarized rural population. In recent years Tanzania has created a number of reforms promoted by the state to attempt to recreate this category ^{of rich peasants} for the purpose of political stabilization. Land redistribution settlement schemes in planned villages and efforts in rural development have this significance if not always explicit - political dimension (Bernstain 1976).

Therefore, while the government may have a genuine intention of improving the living conditions of peasants through providing clean water or agricultural innovations in rural areas, one could later find out the projects have simply led to a further integration of peasants into the capitalist system. The problem arises from the fact that, most of the water supply projects in the rural areas are being financed through foreign governments or agencies. They may have their own objective of giving aid. The foreign governments have an ability to use aid as a tool exerting influence and control over the recipient government. On the other hand if a foreign government exerts influence over the recipient government there is a likelihood that the peasants would be brought under state repression because unless certain conditions are met by the recipient government, the donor government has an ability to withhold the aid.



As pointed above, there are many views which are relevant for the purpose of research study on peasants insertion in the world capitalist economy. There is the economic view on the problem of underdevelopment and peasants. Baring her views on a case study of peasant women in West Baganoyo, Tanzania, Mbilinyi (1980) argues that the state (Tanzania) has become increasingly active in the organization of peasant production, first by making the peasants members of the registered development or Ujamaa Villages. Second that in most areas villagers are required to cultivate at least one acre of food crop and one acre of cash crop. Thirdly villagers are to provide labour on village farms and on self help activities such as schools and roads construction. Mbilinyi sees this as limiting individual production instead of expanding it. Since the peasant individual production is made limited by the state, the strategy looks like proletarianizing the peasants.

But we can assume that individual peasant production has no dynamic to transform the economy. Yet organizing peasant economy may bound to fail. It will never lead to the sort of enthusiasm among the peasantry that for example had led Chinese peasants to transform their environment. Rather it is much more likely to lead to the sort of passive resistance which characterized the Soviet forced collectivization which occurred from the top.



(iv) The Sexual Division of Labour.

Much of the writings on the subject assumes that the introduction of private property is the root cause of the sexual **division** of labour. Most of these scholars base their views on the early work of Engles. The Origin of Family, and Private Property. Another point of view stressed by other writers supposes on the contrary that women from the very beginning were considered as a merchandise or a gift, which were used as an exchange value and also as a way of establishing links between different groups. This vision is rooted in the conviction of the inferiority of women who are manipulated in a society dominated by men.

However, none of these points of view are clearly based on facts, even if the difference of roles based on sex are stressed in almost all works. It seems, therefore, more fruitful to adhere to the position that capitalism does not create the sexual division of labour but it gives it its own content. Instead of looking for the origins of sexual division of labour it makes more sense to look for the modern and specific forms that it assumes in different modes of production.



(a) Domestic Labour and Social Labour

A long discussion on the definition of domestic labour and social labour has been developed lately (See Mbilinyi 1980b, Bryceson and Kirinbai 1980, Bryceson and Ukurela 1980, and many more. Basically the problem has been set in the line of a demarcation of both concepts. One point, stressed in most of the works is the market mediation, thus domestic labour is that which does not pass through market mechanisms, while social labour is that which sells its products on the market. Other consider domestic labour as reproductive and the social labour as productive work (Von Werlhof 1979).

Carmen Diana Feery (1977) suggests a different definition of both concepts, thus she defined productive labour as that in which the output is a goods or a service that it is not susceptible to immediate consumption by the individual. On the other hand reproductive labour may be considered as that in which the output may be consumed immediately. Also social and domestic labour is defined by two criteria, one, the place where it is done, and second, the distinction of the output or the final product. When the domestic work is understood as that executed in the household unit and is bound to consumption by the members of the family unit; social labour will be the work that is not done within the household and or is consumed by others/^{other} than those belonging to the household.



Crossing both criteria there are four possible combinations:-

- (a) reproductive and domestic labour is that which is done in the household or family unit for the maintenance of the members of the family and is for immediate consumption
- (b) Production and domestic labour; it is done in the household and it is the elaboration of the household's own means of economic reproduction
- (c) Social labour; it is done in any economic unit and the final output is used to buy immediate consumption.
- (d) Social labour, it is done in any economic unit and the final product / outcome is not for immediate consumption.

It is easy to realize that women's work is mainly reproductive and domestic, and in this way the function of the domestic work as a creator of surplus is usually hidden. This happens because generally the type of work executed is not remunerated with money. It has been stressed already that reproduction and domestic work is the one that allows for daily and generational reproduction and therefore indirectly produces a surplus which may be considered as an extension of the absolute surplus.

7



In this sense Bryceson (1980) discussing the urban housework says that domestic work allows for the production of values by the labour force, which may be bought and sold in the market. The domestic units in this sense would be necessary for the individual consumption by the workers and also for the bringing up and the development of new contingents of replacement labour force. In the case of the proletarian classes the opportunities of buying services such^{as} laundry, ready food services, household machines etc. are almost non existent due to the high cost of these types of services which then have to be done by the housewife.

Deere studies of domestic unit in the advanced capitalistic countries and in the periphery shows that "they appear to perform a similar function of capital accumulation in reducing the value of labour force, but also stresses the differences: the essential differences between the two units in terms of production and reproduction of labour power is that the domestic unit in advanced capitalism stretches the wages through the transformation of the commodities into use value. The peasant units in the periphery produce the goods and services which are purchased with the wage in the center. Secondly in center economies labour incomes serve to increase the size of the domestic market and in the periphery on the contrary, the expansion of the domestic market is minimal.



Unlike the case of center economics, and of the upper and middle classes of the periphery, peasant women have lost their opportunity of using social services and thus domestic work assumes more functions due to the low level of development of the productive system. A great part of the products and services consumed are made or transformed in the peasant unit, without passing through the market.

It is possible to consider that the rural areas have a double disadvantage because it is necessary to produce cheap food for an urban labour force that in turn is living on very low wages. The traditional agricultural production is not capital intensive, has a low level of investment and is very intensive in manpower, domestic labour force counts for a larger share of the capital accumulation. The low levels of the agricultural prices are possible in large part because the agricultural entrepreneurs use domestic labour to lower their costs. One example is the meal served in work place and prepared by the wives and daughters of the workers as an obligation without remuneration (Deere 1977).

and in a huge number of fields how? are needed and also get some interest

II. HOUSEHOLD, PROPERTY AND PRODUCTION AMONG THE WAGOGO.

In the Wagogo society the basic residential unit is the household. It forms the unit about which the most marked boundaries are drawn providing physical protection to



property and demarcate the most fundamental units in the right of domain (Rigby 1969).

The households are usually enclosed by cattle byres if the household has herds, providing physical protection from animal attack and human aggression to both men and their herds. Within this protective wall, there are different houses. Each house is the exclusive domain of a married woman and her children. Thus in a polygamous household, married women and their children will be identified by which house they belong, for example "the senior house" the second house and so on until the "junior house" are the terms used.

Most of the married women in the household are wives of the household head if he is a polygamist or the wives of other dependents related to him e.g. his sons' wife/wives or his younger brothers' wife/wives living in the household.

The house is an almost completely independent economic unit within the domestic group for the production, storing, distribution and consumption of the staple food crop, and sale of other cultivated produce. With regard to the principal inheritable property, livestock, the house also becomes an independent unit. For a certain part of the household, herds are allocated to every house as soon as



children are born. These livestock are utilized exclusively by the wife of that house and her children and will be inherited solely by her children though they are primarily under the control of the husband/father until his death.

Each married woman has her own fields for the production of the basic subsistence/^{crop} and her small garden patched with vegetables. Crop and small cash crops such as custor and groundnuts for sale. She plants these fields with her own seeds from the previous years' harvest though her husband must supply her with seeds if she has none.

Most cultivation tasks are carried out by women though it is men's work to clear bush for new fields. Very seldom a husband will plant a field of grain for himself. He may plant small patches of tobacco, tomatoes ^{cash crop} and very recently grapes. The produce is usually sold and the profit may be used by him alone.

Every married woman has her own granaries and could be under her exclusive control, although she may not refuse her husbands reasonable request for the use of the grain cultivated while she is with him. From these graneries she will feed her children and her husband, and she is not allowed to sell any grain without the permission of the husband.



It follows that a married women cannot perform her duties as a wife or mother to enjoy her full status and privacy unless she has a house build for her. In the Wagogo custom the husband is obliged to built or otherwise to provide for his wife a house and fields for cultivation. Failure to provide a house for a wife, is a legitimate ground for divorce if it can be shown that the husband is taking no steps to do so.

(1) Economic Position of Cattle in Dodoma Rural District

Tanzania was one of the countries worst provided for, under British dominention or mandate (Ehrlich 1964). One of the most neglected part of the country from the point of development was the Central Province, most of which now comprises the Dodoma Rural District. Wagogo of Dodoma Rural District are semi pastoral people, who subsist mainly upon cereal cultivation but whose value system is strongly oriental towards pastoralism. The Wagogo are not committed to a transhumant pastoral regime although their ecological conditions are somewhat harsher than those of the Maasai or the Earbaig (Rigby 1969). But in the very frequent drought years which beset the District, Wagogo have moved their herds considerable distances in search of grazing land and water (Brooke 1967). He went on to say that the herds may be away from the homestead for several months at a time.



Reading different articles and reports e.g. Rigby (1969) Ehrlich (1964) one would come with a conclusion that given the available technology, the traditional economic system of the Wagogo was a relatively well adjusted, balanced between dependence upon precarious cultivation and the utilization of livestock. Wagogo social organization according to Rigby (1969) involves a considerable degree of residential mobility which was highly adapted to the ecological circumstances. This is still predominantly true.

Historically development in what is now Dodoma Rural District was an insoluble problem for the British Colonial Administration (See Dodoma District Book). Several local surveys were made and plans drawn up, one often contradicting the other. For example in the 30s a report describing the District agricultural and livestock husbandry methods came down on the side of livestock as the basis for development. It urged controlled re-settlement and a curtailment of the unrestricted spatial movement. Local authority legislation designed to implement some of these recommendations was enacted, not always with the intended results.



In the 40s the policy changed, emphasising cultivation in the area, encouraging the cultivation of groundnuts as a cash crop. Even after the disastrous failure of the Overseas Food Corporation Groundnuts Schemes (Ehrlich 1964) on the eastern boundary of Dodoma Rural District official policy still encouraged the growing of cash crops as the basis for economic development in the district and discouraged dependence upon livestock.

However it took several years of crop failure for the export to face harsh realities before policy came around to accept livestock as the basis for development in the district. The solution of traditional Wagogo economic practice obviously is the best suited to the condition in the district. After all the Wagogo have managed to survive for several centuries in the same environment.

Unfortunately even now, the livestock lesson has still not been learnt. There is no general policy yet to encourage the growth of livestock industry in the district. This would be possible on some cooperative basis, with controlled grazing, improving of water facilities etc. However, policy still wavers between livestock and production of various cash crops. A recent move to establish grape



industry for the production of wineⁿ in Dodoma has received a Government backing and finance. This as it were, would benefit only a very small number of people directly and forcing the agro-pastoralist small holders in Dodoma Rural District to the international capitalist mode of production, because they will now produce grape which will be sold in ^{the} world market. The implication for all this, not only for present day policy toward pastoralism but also for the Wagogos' value for livestock which is immense.

In Socialism and Rural Development the pastoral areas are considered under ^a particular section dealing with special problems. However, there is no explicit commitment by the Government to large scale encouragement of pastoralism as a major asset in the drive for rural development.



CHAPTER III

AREA OF STUDY AND METHODOLOGY

I. SOCIAL ECONOMIC CONDITIONS OF DODOMA RURAL DISTRICT

(i) Introduction

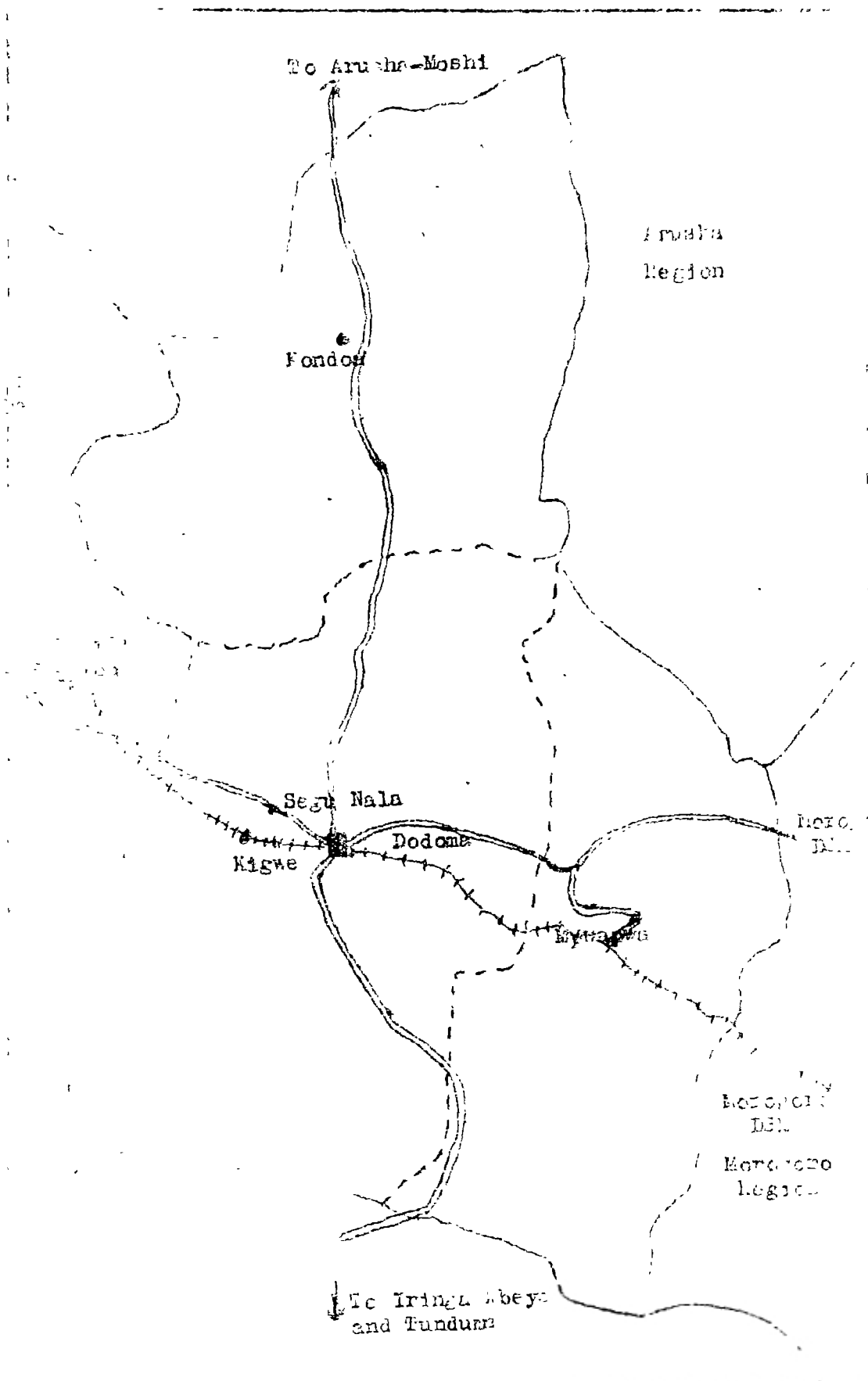
Dodoma Rural District, one of the three districts into which Dodoma Region is divided lies on the central Plateau at an average elevation of 1,000 metres above sea level. Dodoma Town which is going to be the new capital of the country lies in the centre of this district at a distance of about 475 kilometers west of Dar es Salaam. It is the largest town in the region with a population of 60,762 people in 1978. This town and the district as a whole lies at an important cross roads. The main east to west railway line as well as the trunk road from Dar es Salaam to Kigoma Mwanza and Bukoba passes through. Also the north - South route from Moshi, Arusha to Iringa, Mbeya and Tunduma runs across the district.

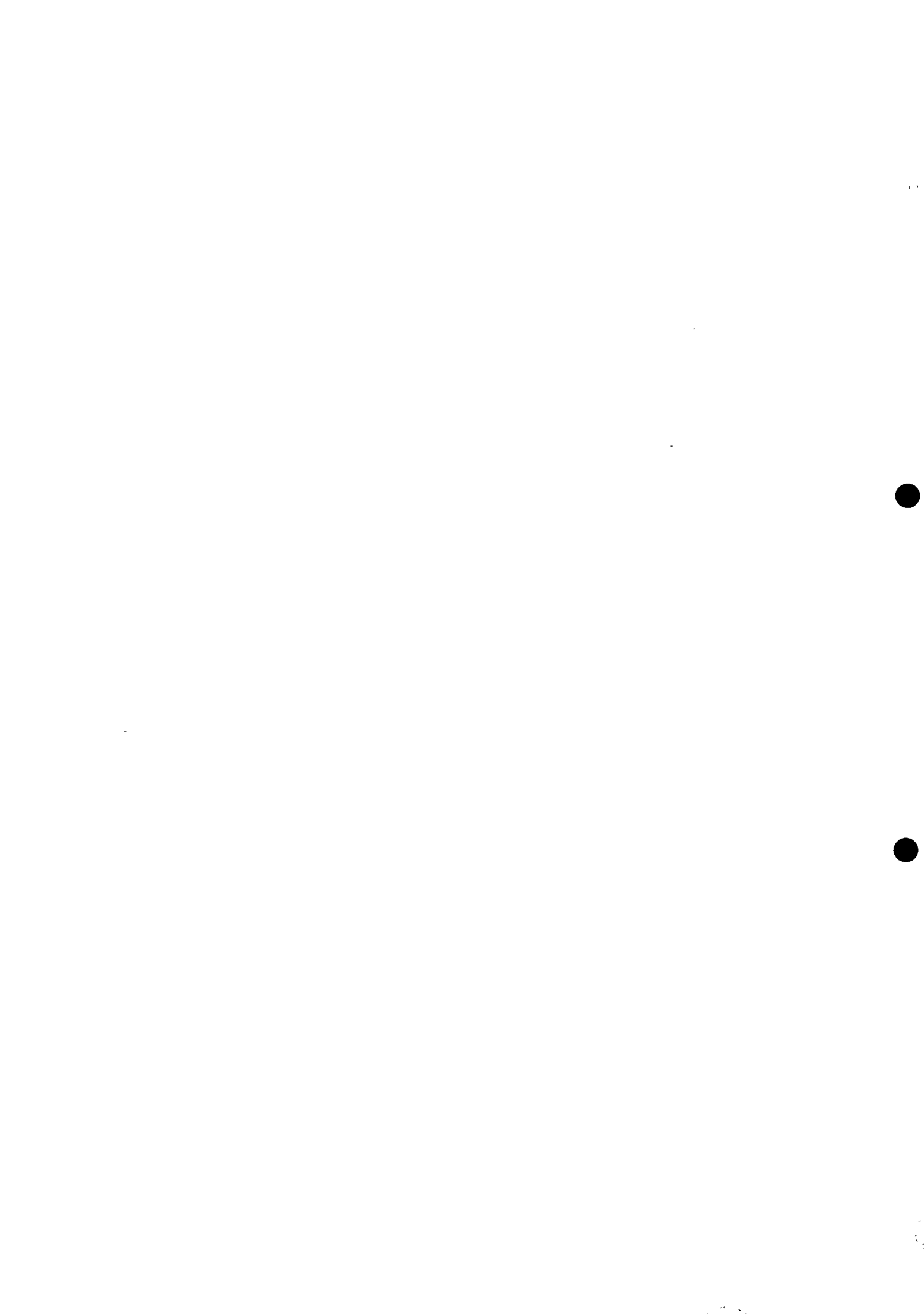
The District which has an area of 16,580 square kilometers and a population of 274,514 in 1978 occupies the south western portion of the Region and constitutes almost half of it. Other districts in the region are Kondoa to the North and Mpwapwa the smallest of the three districts occupies the south eastern portion. (See Map No. I)



ADMINISTRATIVE AREA OF DODOMA REGION

ROADS COMMUNICATION AND THE STUDY AREAS.





By far the main economic activities of the District like that of the whole Region is agriculture and more particularly livestock keeping. According to the 1979 livestock census there were 1,096,450 cattle 464,940 goats and 49,937 sheep or a total of 1,801,979 animals in the District (Source Mpango wa Maendeleo wa Mkoa 1981/82 pp. 7). The cultivation and sales of crops from traditional farming is the second source of income.

Industry plays a very minimum role in the economy of the district or that of the region. Up to 1980 there were small establishments, mostly building contractors in Dodoma town. There is an Industrial Complex at Zuzu 20 kilometers west of Dodoma town, and several quarry works with a total employment capacity of only 1,800 people (Source CDA Report of May 1980).

(iii) Topography.

Like the rest of the Region, Dodoma Rural District is a part of the central plateau of East Africa which extends from Ethiopia in the north to Transvaal in the south of the continent. In this district pene plains are predominant.



Most of the pene plains lie at the average attitude of 1,000 meters above sea level and it has been warped to form an irregular basement in the north western corner of the district, while in the south east it has been dislocated and lowered to some 300 meters below its average height. The peneplains areas are sometimes occupied by isolated hillrocks or in places forming irregular chains. In between the surrounding hills and hill chains are plains covered with eluvial, colluvial and alluvial deposits formed by the weathering of an underlying bed rock.

Drainagewise, the district like the whole Regions surface flow is characterized by a distinct north to south trend in collector tributaries. Water then leaves the district and the whole region in an eastern direction. Or as is the case with Bubu River from Kondoa District, remains inland wasted in Bahi Swamp which is part of Kigwe village.

(iii) Climate.

The climate of the district is characterized like that of the whole region by a marked seasonal distribution of rainfall. It is this rainfall regime which in Dodoma Rural District sees little or no rainfall falling from May to November, followed by a season of low and uncertain rainfall where there is a distinct water deficiency during





most months of the year. This in turn governs a wide range of economic activities. In an economy that is still based on agriculture at a subsistence level, wide spread crop failure due to insufficient or ill-timed rainfall may lead to severe food shortage or famine. The scarcity of rainfall combined with drying winds and low humidity during the drought season exaggerates the already serious problems of soil erosion in the district, resulting in very high evaporation rates that may seriously reduce the level of impounded water.

(a) Rainfall

Table 3:1 shows the mean annual rainfall in 5 locations in the District. The rainy season in Dodoma District begins in November and ends in May with heaviest rains usually occurring in January. Table 3:2 shows the distribution of rain throughout the year at Dodoma, of which distribution may be taken as typical of the district.

As already mentioned, the patterns of human activity in the district are still largely determined by the amount of rain received during the rainy season. This tends to vary widely. Just how widely is indicated by the bar-chart shown in Table 3:3, which is again based on





Table 3.1

Average Annual Rainfall in 5 Locations in Dodoma District. (1961)

Location of Meter or rain gauge Station	No. of yrs of observation	Elevation in meter	Annual Average Rainfall in mm.
(1) Bahi	12	830	520
(2) Buigiri	12	1010	605
(3) Dodoma	29	1110	567
(4) Masange	19	1220	720
(5) Mvumi Mission	Not known	1100	550

Source: Department of Meteorology, Dodoma 1961.

observations made at Dodoma over a period of 43 years, showing an average of 22.1 in. or 567.m. of rainfall.

(b) Evaporation.

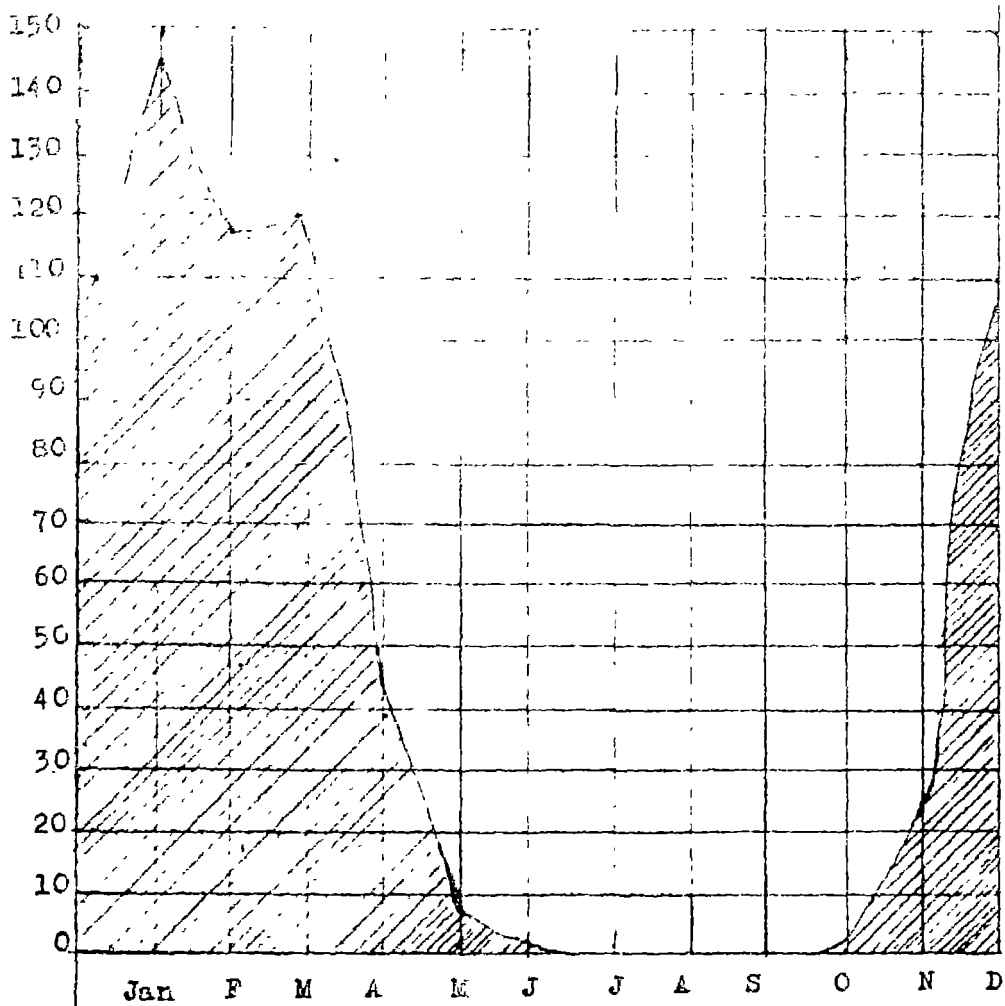
The sun, the wind and the prevailing humidity act together to affect the evaporation rate. The evaporation rates ^{are} of interest in connection with losses from impounded water. It is also basic to the methods which have been developed to forecast the optimum water requirements for domestic water supply projects as well as for crop growing in the District.





Table 3.2

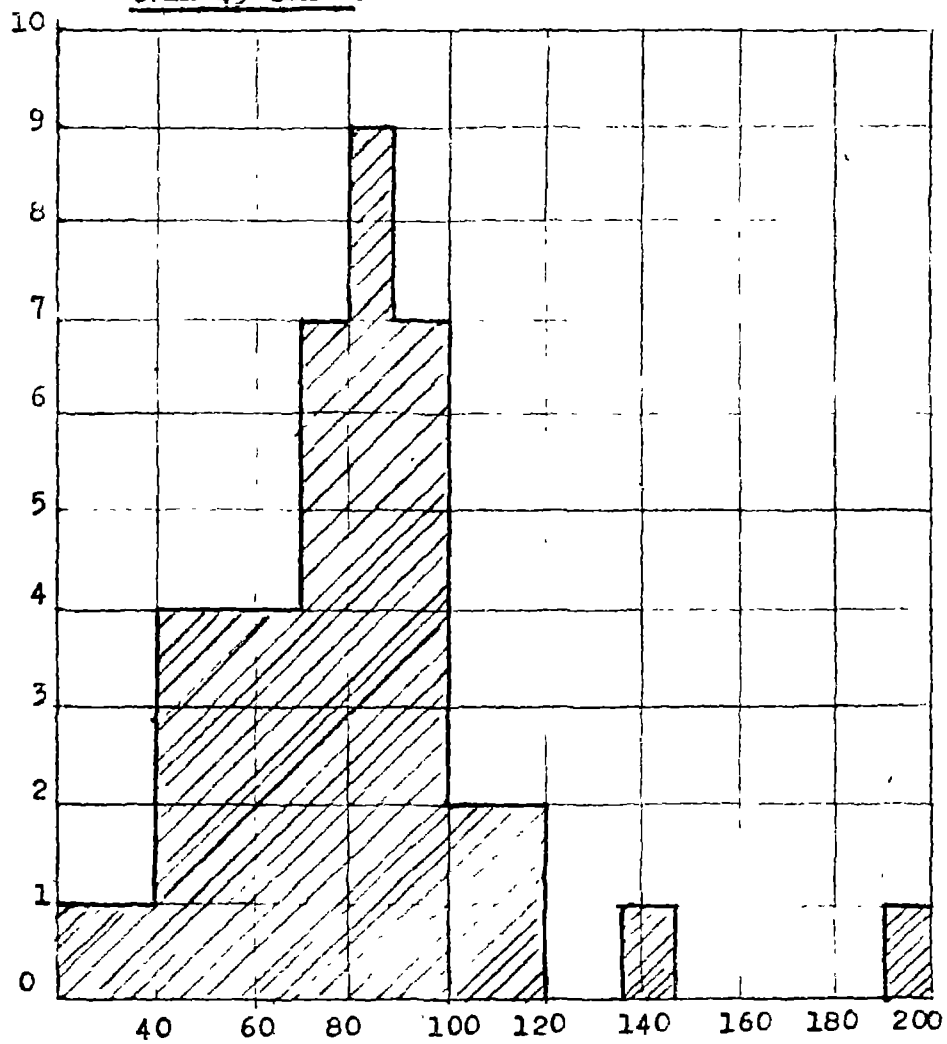
AVERAGE MONTHLY RAINFALL AT LUBONA (1971-1972)



Source: CDA Technical Supplement No. 1 pp. 8.



Table 3.3: VARIABILITY OF ANNUAL RAINFALL AT DODOMA
OVER 43 YEARS.



Source: Department of Meteorology Dodoma.

Annual rainfall as percentage of overall
annual Mean(1963)



Measurements made at five stations by the Meteorological Department in the District indicate that the maximum rates of evaporation in Dodoma District tend to occur in September. This is connected with natural coincidence of relatively cloudless condition increasing ambient temperature and higher wind speeds.

(c) Temperature

According to the report of the Meteorological Department, the temperature patterns of Dodoma Rural District are based on observations made at Dodoma. Variations throughout the district are mainly associated with differences in altitude. The lowest day time temperature during the year is observed during the month of July with an average maximum at about 15.00 hours of 25.6°C. Average monthly maximums then start to rise with a fairly steady increase through the months of August, September and October to reach the highest temperature of 30.6°C in November. Then with the onset of rain, monthly average maximum start to decline through December and January.

Night time temperature vary throughout the year in much the same manner as the day time temperature, except that from January to May they tend to be relatively higher. Table 3:4 shows the temperature of Dodoma as day time and night time average temperatures respectively.

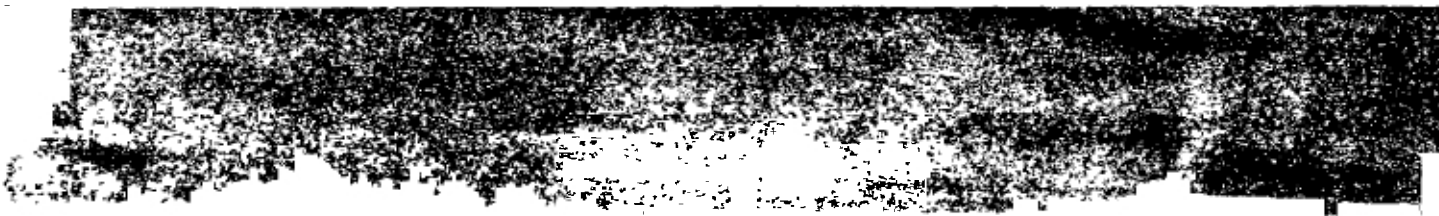
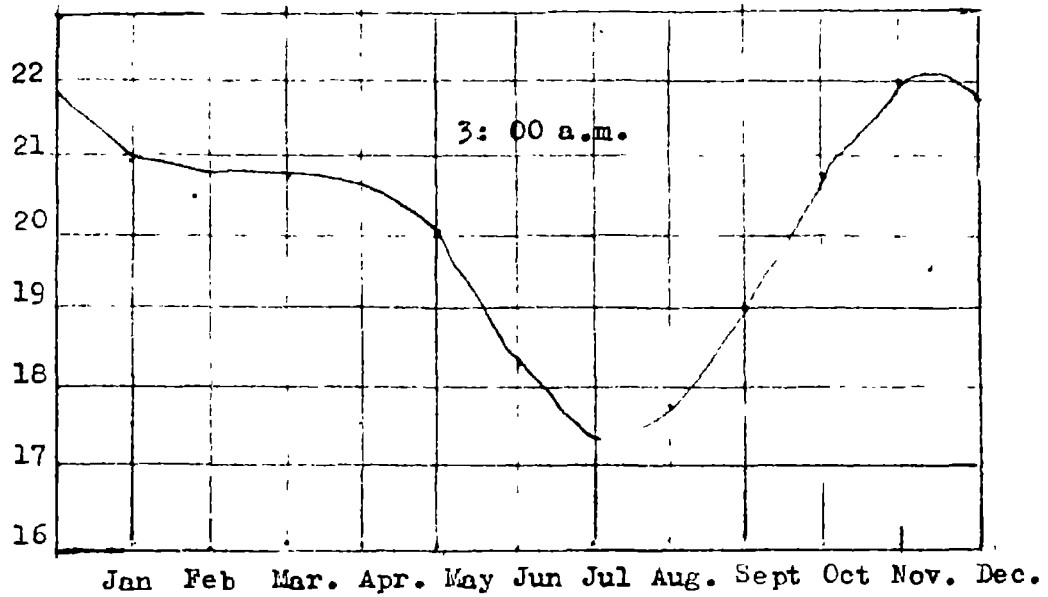
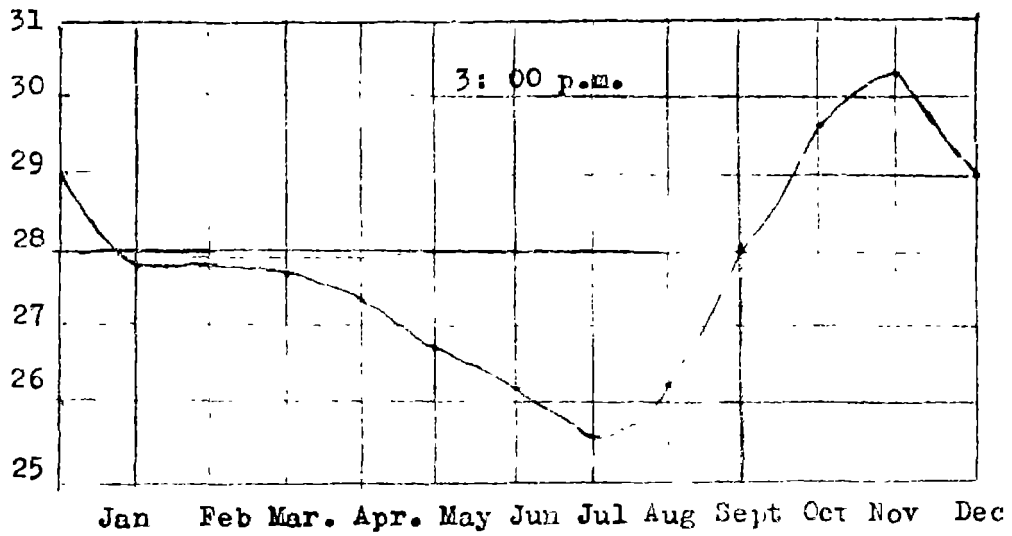




Table 3.4: AVERAGE TEMPERATURE AT DODOMA THROUGHOUT THE YEAR



Source: Meteorological Department Dodoma.

The hottest hour and the coolest hour of the day have been measured for the past 26 years. (1963)



(1) Hydrology.

According to the Dodoma Region Water Master Plan (Vol 2 pp. 15 - 38) Dodoma District falls under three major catchments namely:-

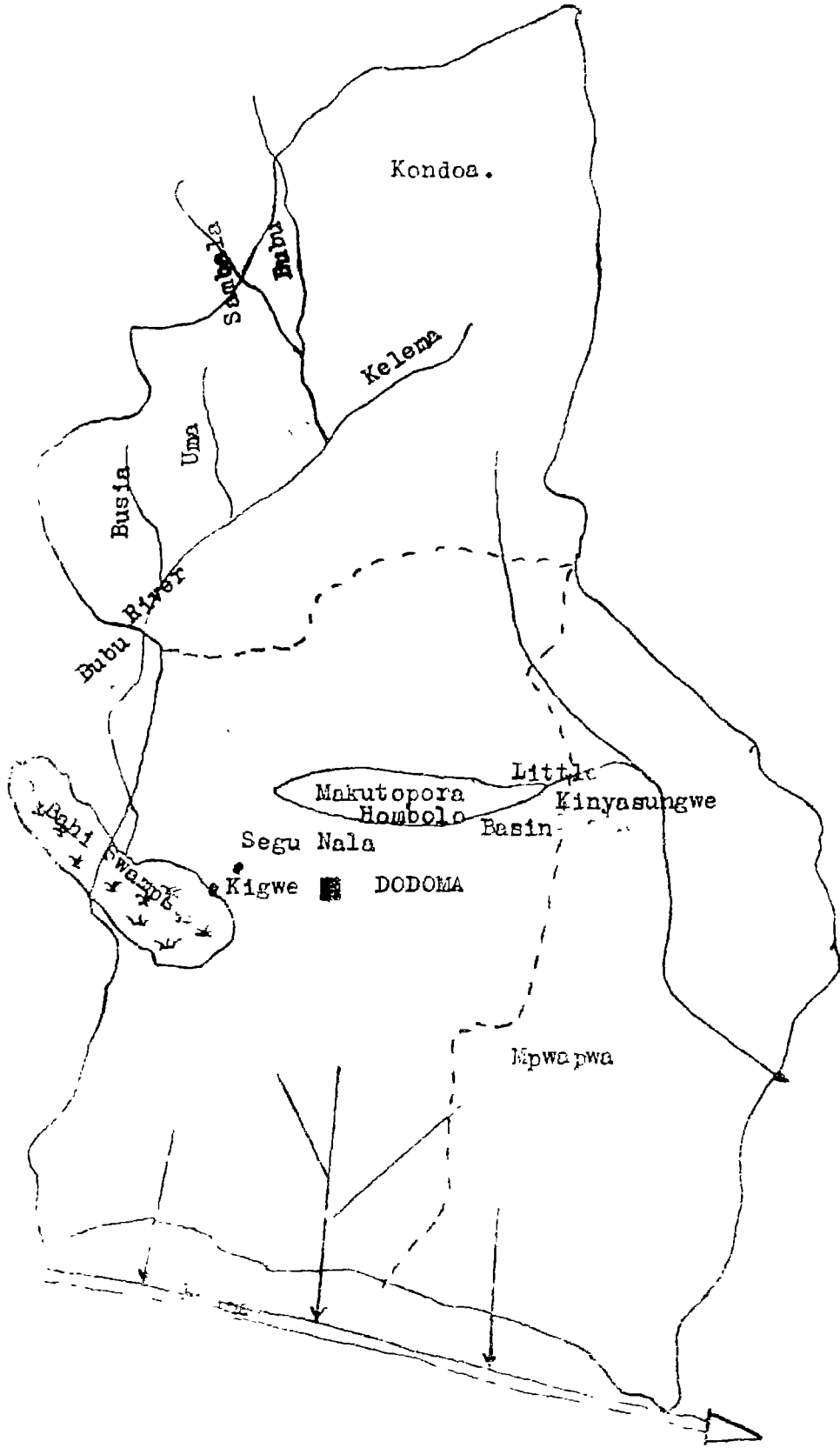
- (1) The Great Ruaha flowing to the east and the Indian Ocean.
- (2) The internal drainage catchment.
- (3) The Kinyazungwe flowing east to Mpwapwa District and then to the Indian Ocean.

These major catchment areas are shown along with sub catchments or watershed areas occurring within each division on Map 2. The only major water body in the District is Honbolo Lake. Although smaller bodies exist at the Imagi, Mutumbulu, Msalato, Ikowa, Buigiri, Nondwa reservoirs etc. Virtually all rivers are intermittent being dry for seven or eight months of the year.

In the Makutopora, Honbolo, Nzinge and Bahi Swampy basins, Mbugas and extensive area of grey cracking soil are found surrounded by areas of sandy loam. It is in these zones characterized by sedimentary deposits, weathered rocks and dykes that the ground water deposits are found.



DODOMA REGION HYDROLOGY AND GEOHYDROLOGY.



Geological Department Dodoma.





Substantial secondary tributaries drain the district such as the Luaha, Kikuyu Mohanze and Kikuyu River System.

(e) Quality of Water in the District.

This information is based on the water samples collected by the Dodoma Region Water Master Plan Team between September and December 1971, April - June 1972 and April to June 1973.

Distribution of total dissolved salts (TDS) in the whole District varies between 500 parts per million (p.p.m) to 3,200 p.p.m. There are however isolated areas with high salt content varying between 3,200 p.p.m. to 7,000 p.p.m. Such areas could be found mostly around Bahi Swamps. At Kigwe the borehole for Domestic water supply encountered a very high salt content of 5,000 p.p.m.

The quality standard adopted by WHO (World Health Organization) and various other countries has been studied in light of the water quality in the country. Water quality standard suggested is shown in Table 3:5. For comparison purposes, the quality and standard of water as adopted by the Tanzanian Government is also shown in the same table referred above.

It is a pathetic revelation that in most cases the standard of most chemical quality has not been considered and in the ones considered the quality is below that of WHO





Table 3:5.

WATER CLASSIFICATION IN THE REGION

CHARACTER IN P.F.M.	GOOD	FAIR	POOR	UNSATISFA- CTORY	TEMPORARY TANZANIAN STANDARDS
1. Arsenic	0.02	0.02-0.035	0.035-0.05	0.05	0.05
2. Bi-carbonate	150	150 - 200	200 - 500	500	N.C
3. Boron	1.25	1.25-2.50	2.50 -3.75	3.75	N.C
4. Calcium	75	75-150	150 - 200	200	N.C
5. Carbonate	10	10-50	50 - 120	120	N.C.
6. Chloride	200	200 -250	250 - 600	600	600
7. Fluoride	0.02	0.02-0.055	1.5 - 3.0	3.0	3.0
8. Fluorise	1.5	1.5 - 2.0	2.0 - 4.0	4.0	8.0
9. Iron	0.2	0.2 - 0.3	0.3 - 1.0	1.0	1.0
10. Lead	0.02	0.02- 0.05	0.05- 0.1	0.1	0.1
11. Magnesium	50	50- 125	125 - 150	150	N.C
12. Nitrate	20	20- 50	50 - 100	100	N.C.
13. Potassium	0.01	0.01-0.03	0.03-0.05	0.05	0.05
14. Sodium	100	100-200	200 - 300	300	N.C
15. Sulphate	200	200-250	250 - 400	400	600
16. Zinc	3	3-5	5 - 15	15	15
17. PH	8	6-7;8-8.5	8.5-9.2	5.5&9.2	6.5-9.2
18. Phenophtaline Alkalinity	5	5 - 1.0	1,0-1,5	72 - 15	N.C.
19. Total Dissolved Solids	500	500-1,000	1,000-1500	2,000	2000
20. Total Soluble Salts	300	300-1,500	1500-2000 but up to 3000 could be used with caution	3,200	N.C

Source: Ministry of
Water and Energy

NC = Not Considered.



standards. If provision of rural population with clean water is to improve people's health, then the chemical quality must be one aspect which must be considered. So far it has been proved that excessive fluoride in water contributes to bones malformation in the unborn baby or tooth decay among grown ups. But as can be seen from table 3:5, the Tanzanian standard of fluoride is equal to the one considered as unsatisfactory according to WHO Standards. Moreover salt contributes to hypertension condition in people but the Tanzanian chemical standards of water has not considered that aspect, to name only a few aspects.

(iv) Human Population Distribution.

In 1967 Dodoma Rural District had a population of 174,440. The average population density was 17.4 people per square kilometer. By 1978 the district population has grown to 276,737 people with a density of 26.3 people per square kilometer (Sembajwe 1980).

Population density varies from area to area within the district. In 1967 the density was from over 50 people to 1 person per square kilometer. Although its density was low compared to densities in other districts of the region in 1978, it was alleged (Sembajwe) that Dodoma Rural District was over populated. This was determined on the basis of the population carrying capacity of each area. The carrying



capacity is determined using a number of assumptions such as crop yields, crop prices and expected income levels. At a given level of income and diet, a total population which a particular district was expected to apply and support by agriculture was derived and compared with the total population recorded in 1978. In this way overpopulation was reduced.

According to the 1978 population census a large proportion of the population in Dodoma Rural District was under 15 years of age, 46.6% as compared to the Regional ration of 45.2% (Sembajwe 1980 Appendix 1). From the same appendix the dependency ratio, that is the ration of persons under 15 plus those who are above 65 relative to the active population - 15 to 64 years of age could be calculated. It is rather interesting that dependency ratio is quite high being 1.03 compared to a Regional ration of 1.01. This is significant to rural women's wider participation in production activities as well as the domestic labour.

(v) Economic Position of the District

Dodoma Rural District is semi-arid resulting from low and erratic rainfall, high evapor-transpiration and low moisture - holding capacity of the surface soil. The above factors and the spread overstocking and overgrazing make the district susceptible to extensive soil erosion.



The land under crop almost entirely consists of cereals, oil seeds and nuts. However, the yield per hectare of all the crops and the per-capita income from them is so low that the income from livestock sales, although they are also low, still are on average, seven times as great per annum as cash crops. Livestock could then be considered to provide a relative economic stability in an unstable agricultural environment, still largely of subsistence nature.

(a) Food and Cash Crop Situation.

The main food crops of the district are bulrush millet (uwele) surghum and maize. To much lesser extent beans, cowpeas, cassava, sweet potatoes are grown almost entirely for local consumption.

Traditional methods of cultivation apply over much of the district. This involves households clearing small and scattered plots of land, working them until the soil is exhausted and then moving on. These methods, especially when practiced on land of broken and uneven form, has helped increased erosion problems already serious through overgrazing. The settlement of the rural population in Ujamaa Villages offers the opportunity for defining and regulating cultivation areas, improving crop husbandry and soil management. Of late fertilizers have been introduced. Irrigation is until now done by hand on small scale mostly for vegetable production for urban sales.



Actual figures of crop production can not be ascertained with much accuracy and the interplanting of crops makes figures unreliable. However Table 3:6 shows estimated Regional average between 1974/75 and 1979/80 Season (Source The Regional 4th Five Year Development Plan).

The table shows the wide fluctuation in production in the Region over the period, an indication that the average figure is rarely obtained. Moreover the figure only shows the amount of crop sold, this is because the subsistence need must always be met first when food crops are also ^{cash} crops and is the surplus remaining which provides the marketable element from which income is derived. To take the staple crop of maize, millet and sorghum, the main food crops in the Region it would appear from table 3:6 that over the past five seasons, the marketable surplus has been around 33,000 metric tons, $\frac{3}{4}$ of which has been maize which has a greater market value than millet or sorghum.

Horticulture is not well developed in the district, climate militate against the growing of fruits and vegetables, and where it is done at all, it is along traditional lines with hand watering. Such vegetable gardening as is undertaken, concentrates near towns and villages in more favourable locations especially valley bottoms where the water table is nearer to the surface. The main producing villages are all within 20 - 30 kilometers of Dodoma town. Tomatoes are



the most prolific crop, followed by onions, cabbage, spinach, okra, carrots and radish. Fruits are not cultivated to the same extent, but mangoes, dates and pawpaw are relatively common.

Table 3.6. Dodona Region Food & Cash Crop
Production

	In metric tons.				
	Maize	Millet/Sorghum	Gr.nuts	Oth.or/Seeds	Grapes.
1974/75	33,000	20,000	17,000	9,600	740
1975/76	52,000	16,000	-	-	-
1976/77	64,000	24,000	15,000	3,800	600
1977/78	52,000	20,000	14,000	5,700	980
1978/79	40,000	14,000	17,000	4,200	5,145
1979/80	47,000	12,736	11,407	2,600	6,609

Source: RDLs Office (Mpango wa Maendeleo 1981/82 na Mpango wa Nne wa Maendeleo ya Miaka Mitano 1981/82 - 1985/86).

Oilseeds and groundnuts have been a relatively consistent source of income in the whole Region. But now grapes are proving to be of great importance as cash earner in some parts of Dodona Rural District, often undertaken on communal cultivation in the villages. The potential assuming a market for grape production is substantial in a part of the country



where this crop, more than any other so far tried can bring by far the greatest return on money invested in a drought year. Moreover the vines yield two crops per season, which no other crops have yet done in the district. All or nearly all grapes are sold to the National Milling Co-operation winery in Dodoma which produces wine for sale Nationally and Internationally.

(vi) Water Situation and Utilization in the District.

To give an overview picture of the water situation in general in this district, the various climatic factors of some meteorological stations must be brought together, regarding the available amounts of rain water and their distribution throughout the year. With this we obtain a rough estimate concerning ground water recharge or soil moisture utilization. It is obvious that potential evaporation exceeds rainfall in most months of the year and there is probably no area in the district without 5 months long water deficit.

On the whole there are 8 dams in the district. Of these one has been constructed to raise the level of an existing lake - that is Lake Honbolo. Eight reservoirs are officially considered as rural water supply sources.

The three major reservoirs on the Kinyasungwe system, that is Honbolo, Ikowa and Mabalo, were primarily constructed as flood control structures to ameliorate local flooding



problems. Of these three reservoirs, two - Hombole and Ikowa, have also contributed modest benefit to local water supply, irrigation and fishing.

The remaining reservoirs scattered throughout the district essentially provide seasonal water for livestock only. Multipurpose use and benefits are limited and in many cases domestic water supplies come from nearby shallow wells and borcholes. The major consumer of surface water is evaporation.

Since the early 1930s the major emphasis has been on ground water development raising to the peak in the early 1970s with "Operation Dodoma" in which 90 borcholes were drilled within the district between 1970 - 74. Table 3:7 shows the distribution of these sources in the Region and as to their successfulness as source of Domestic Water Supply. The figures were obtained during my field work period in Dodoma from the Regional Water Engineer's Office.

As can be observed from Table 3:7 hardly half of the villages in the whole district are provided with Domestic Water Supply System. There are repercussions for those villages listed as supplied with domestic water supply. There is great possibility that most of those villages with water supply systems are out of working conditions as has been pointed out by Mujwahuzi (1978).



Table 3:7. Water Situation and Utilization in Dodoma Region.

District	NO. of Villages	Borcholes Drilled	Successful Projects	Complete Projects
Dodoma District	159	367	137	97
Kondoa "	154	126	71	69
Mpwapwa "	110	129	57	39

(b) New Project Proposed For 1981/82

Dodoma District	4 project of Borchole drilling
Kondoa "	2 " " " "
Mpwapwa "	2 " " " "

(c) Principal Water Reservoirs in the Region

Principal Reservoirs in the District with their Capacity
when full

(1) Ikowa	3,600,000 Cu. M.	Dodoma District
(2) Buigiri	490,000 " "	" "
(3) Hombolo	32,700,000 " "	" "
(4) Nodwa	5,900,000 " "	" "
(5) Dabalo	4,800,000 " "	" "
(6) Mlowa	1,100,000 " "	" "
(7) Matumbulu	360,000 " "	" "
(8) Chamwale	290,000 " "	" "

(d) New Proposed Project

- (1) Nchinila.



II. The Study Area

The study area covers two villages in the district Kigwe and Segu Nala. Kigwe as a village with water supply system and Segu Nala as a village without water supply system.

(i) Kigwe Village is one of the most important trading centres west of Dodoma and before Bahi. Kigwe has a station on the central line, and through the village runs the road leading down to the southern end of Manyoni District in Singida Region. Kigwe is only 8 kilometer South of the East West trunk road and could become the centre for decentralized cattle by-product industry. At the moment there is a creamery with a capacity of producing 3,600 litres of ghee using about 36,800 litres of milk per annum. It is only 30 kilometers by rail from Dodoma.

The village has an estimated area of 59,550 square acres, a population of 4,876 people according to the 1978 census divided into 969 households with 1,823 people with the capacity to work. The distribution of population according to age and sex is shown in the following table basing on 1978 census.

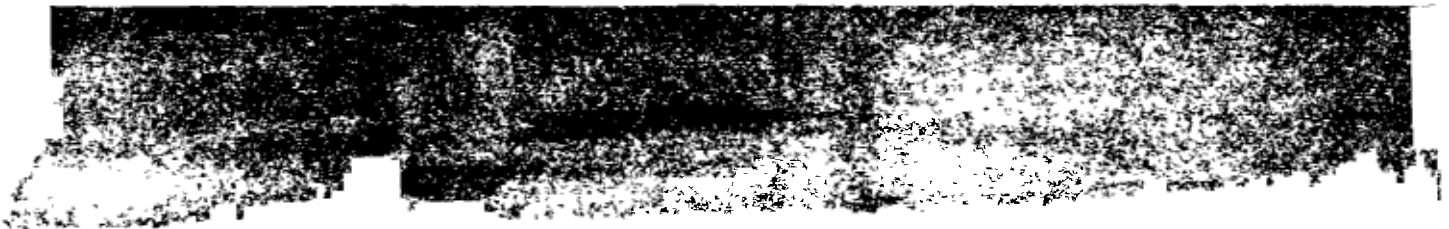




Table 3:8 Kigwe Population According to 1978 Census.

	Male	Female	Total
0 Years	72	79	151
1 - 4	263	326	589
5 - 9 "	361	391	752
10 - 14 "	294	299	593
15 - 24 "	306	380	686
25 - 34 "	201	317	518
35 - 44 "	181	252	433
45 - 54 "	256	188	444
55 - 64 "	193	242	435
65 and over "	129	146	255
	2,256	2,620	4,876

The village has a total population of 8,336 livestock according to 1979 livestock census, with a breakdown of 5,356 cattle, 2,099 goats and 879 sheep. There is an estimate of 1.5:1 ratio of livestock per person in the village.

Land use can be divided into three main categories. The greater part of the plain area is rough grazing land covered with scrubs and acacia thicket, occasionally punctuated by baobab trees. The second area consists of hills which border the east, south and west sides of the village. These hills are generally covered with various species of trees except where rock out-cropping occurs on the highest peaks





of the hills. The third category which covers only about 10 percent of the village consists of areas of households and cultivation, which occur mainly in large valleys adjacent to swampy areas where surface and ground sources of water are available and where soil is better. These cultivated areas are devoted to mixed farming including the growing of maize, millet, sorghum, groundnuts, oilseeds and tomatoes. The area includes an estimated 900 acres of village shamba (bega kwa bega) and a 25 acres of vine yard which belong to village government.

Farming for cash crops, like oil seeds and grapes or vegetables, including tomatoes and onions would be possible on a more profitable scale in certain areas, provided suitable irrigation water could be made available. As it is, the major part of the village remains grazing land for livestock and a conservation zone for wildlife. At the moment much of the village is considerably overgrazed and the number of animals must be reduced if serious wind and water erosion is to be avoided. Already it has been estimated by HADO (Hifadhi Ardhi Dodoma) that the low land areas in the village are losing over 3mm. of top soil per year, and deep erosion is threatening many of the upper slopes. This erosion is caused by the excessive cutting of trees and bush for the fuel used in the village and for the production of charcoal which is taken to Dodoma town to be sold.



The village consists of a densely settled village centre of some 545 out of 969 households surrounded by a wide area of farmland, grazing land and scattered households mainly occupied by cattle owners. The rest of the 424 households are situated in this part of the village.

The village shop, C.C.M. office and Ward office occupy the central part of the village. There is also a small market, a tea room managed by the U.W.T. branch, a milling machine, a creamery and a carpentry shop all owned by village Government. All these buildings or houses have corrugated iron sheet roofs. Walls are made of either poles and mud or mud bricks. Only the village shop, the C.C.M. office and the Ward office are built of cement blocks.

Majority of the houses belonging to the villagers are traditional houses mostly built of poles and mud walls and roofs. North of the village centre there is a primary school with teachers' quarters and a Roman Catholic Mission. North East of the village centre there are: a Primary Court, a Police Station and a Dispensary. Below the Primary School is the borehole which supply water to Kigwe village as well as Mpinga and Nkulugano villages.



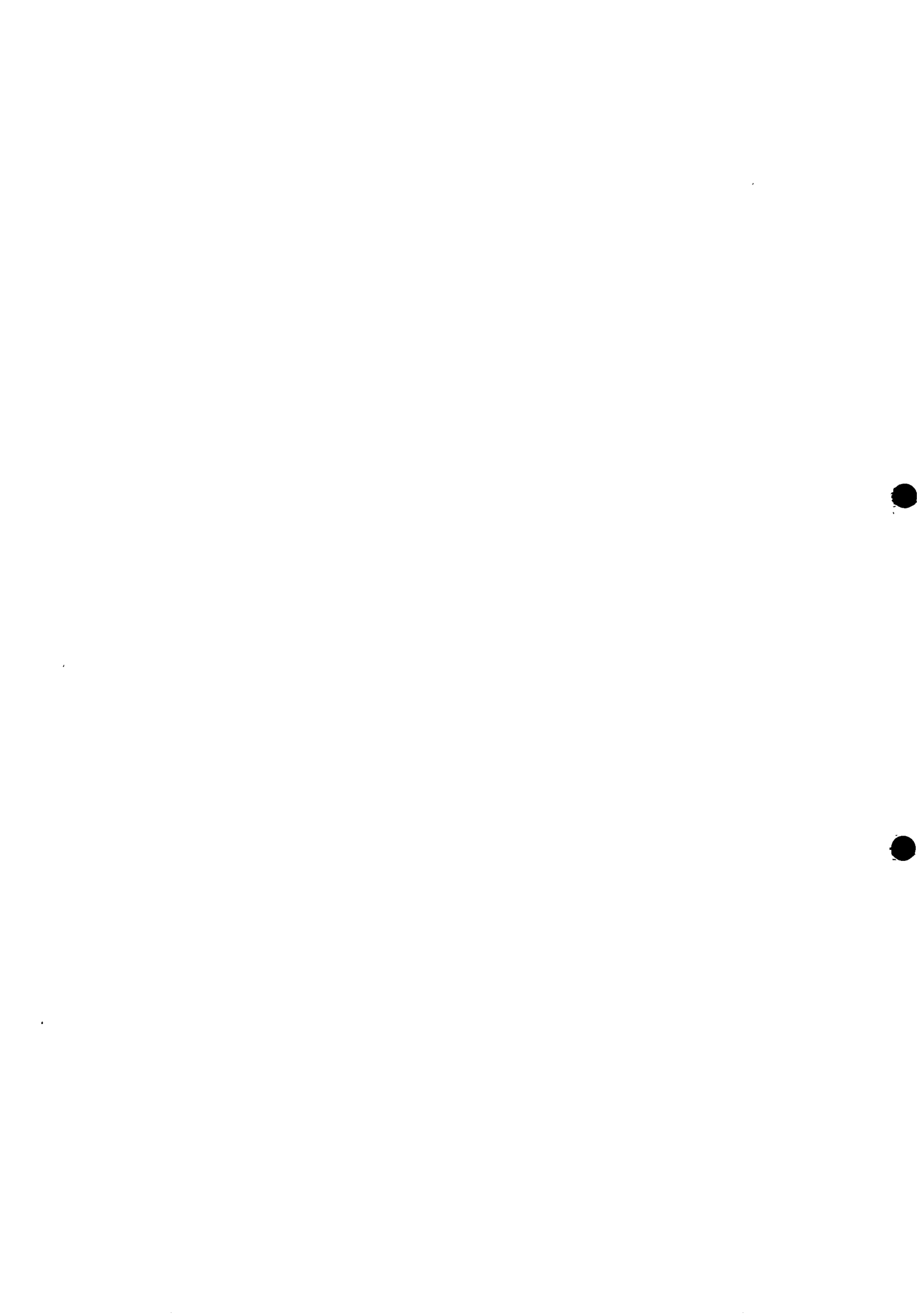


Originally Kigwe was a very small settlement on the railway station, but it was greatly expanded in the years 1970 - 74 and now consists of a mixture of people with different origins. Mostly they are Wagogo, few Wanyamwezi, Wanyiramba and Warangi have also settled in the village. It was registered as an Ujamaa Village on 20/6/71.

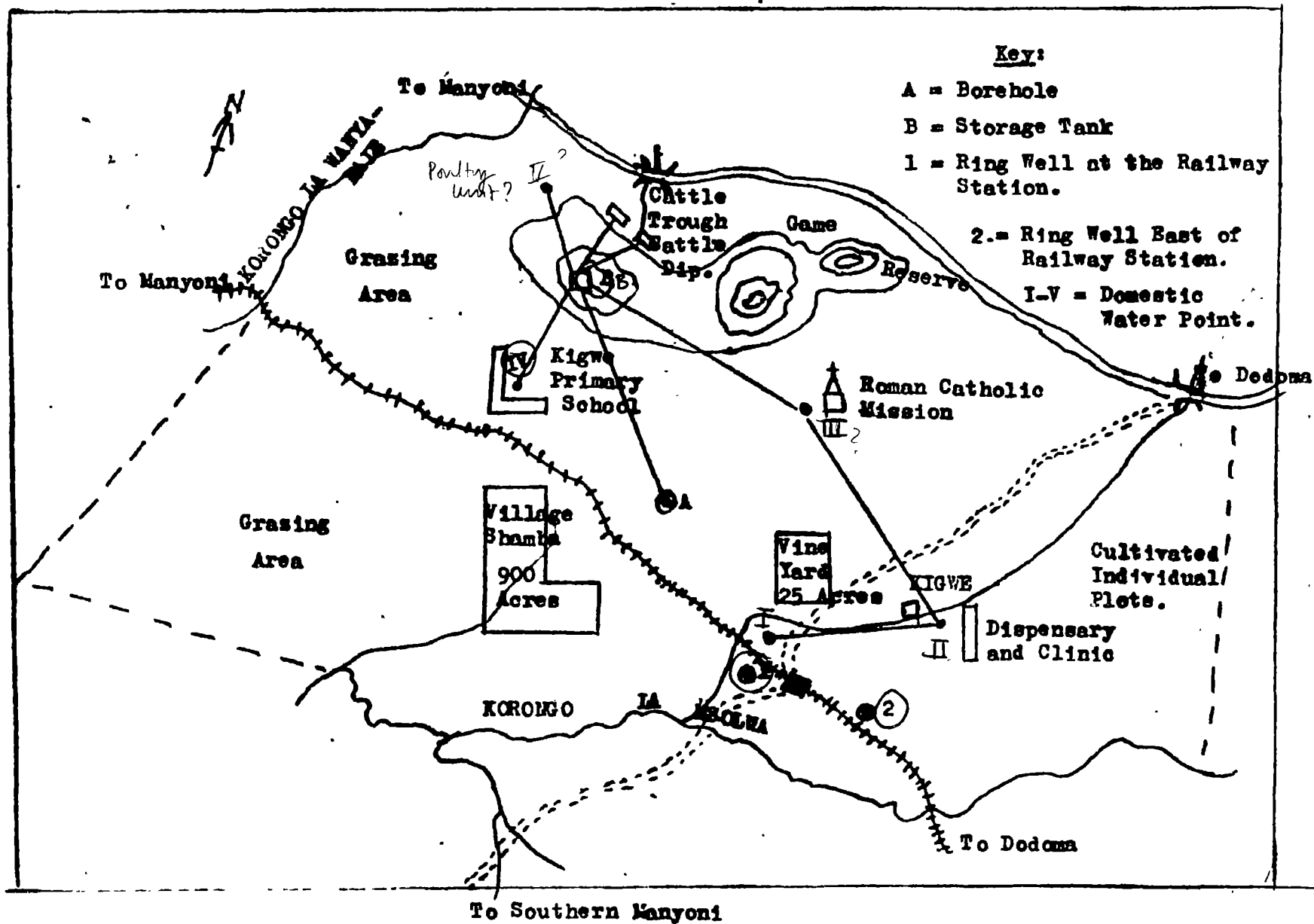
Communal activities consist of communal shamba (bega kwa bega) of 900 acres run by a joint effort of some 1,823 people with a capacity to work. Everyone of the able body is assigned to cultivate half an acre. A vine yard of some 25 acres and a poultry unit with a capacity of 7,000 birds, belonging to the Village Government.

(ii) Water Supply System.

The village is served by three different water supply systems. The first is the piped water supply (see Map 3). The second water supply type is at the railway station. Here there is an uncovered ring well. A person must use a container tied at the end of a long rope to scoop the water from the well. Another such well, but of the limited water yield is found at about 1 kilometer East of the railway station. The third type of water supply and the one mostly used in the village especially during the rainy season are the many traditional wells situated all over the village. Mostly adjacent to swampy areas, where surface or ground water is available.



MAP 3: KIGWE VILLAGE SHOWING THE SETTLEMENT AND THE WATER SUPPLY SYSTEM.



Ring Well



/

The first water supply system consists of 5 domestic points located in the village centre numbering 1 - V on the map (4). Domestic point I is intended to serve mainly the residence near the headquarters of the village Government site. No. II is to serve the Dispensary, Police Station and the Residences around. No. III the Roman Catholic Mission and the round about residences. No. IV the Primary School and the Teachers' Quarters, and No. V the poultry unit which also serves a number of households around.

From the map it may be seen that the distances between the houses and the domestic points or the ring wells are almost always short in the centre of the village. For very few households the distance is more than 400 meters. The outlying areas of the village consisting of three out of four hamlets are not served with any domestic water points, making an average distance of not less than 3 kilometers. As a result these outlying households are forced to depend on the traditional wells.

(iii) Selection of Kigwé as a Study Area.

Kigwe Village was chosen as a village with water supply project. This choice was based on the survey of rural water supply in Dodoma Rural District by Mijwahuzi (1978). First a number of projects were chosen which appeared of suitable



size and were presumably in good working conditions. At a closer examination most of them had to be discarded because they were either out of working condition or of difficult access or presented too many disturbing factors.

In the end Kigwe Village was chosen. Again the choice was based on Mijwahuzi's report. According to him, the Kigwe Water Supply System is "magnificent", on the ground that water is pumped from a borehole (330 meter deep) of a rich water aquifer to an overhead tank. From this storage tank water flows by gravity to several domestic water points and to a cattle trough in the village. From this report it was estimated that a regular supply is ensured and that no other sources were used which could disturb the test situation.

(iv) Segu Nala Village.

This village developed some what later especially during villagization programme of 1970 - 74. Segu Nala is already well served by road linking with all areas round about. It is 15 kilometer from Dodoma on the Great East-West Truck road. The village is estimated to be 24,800



square acres with a population of 745 households with a population of 3,431 inhabitants of which only 1,511 people have a capacity to work. The following table gives the composition of Village Population by age and sex groups.

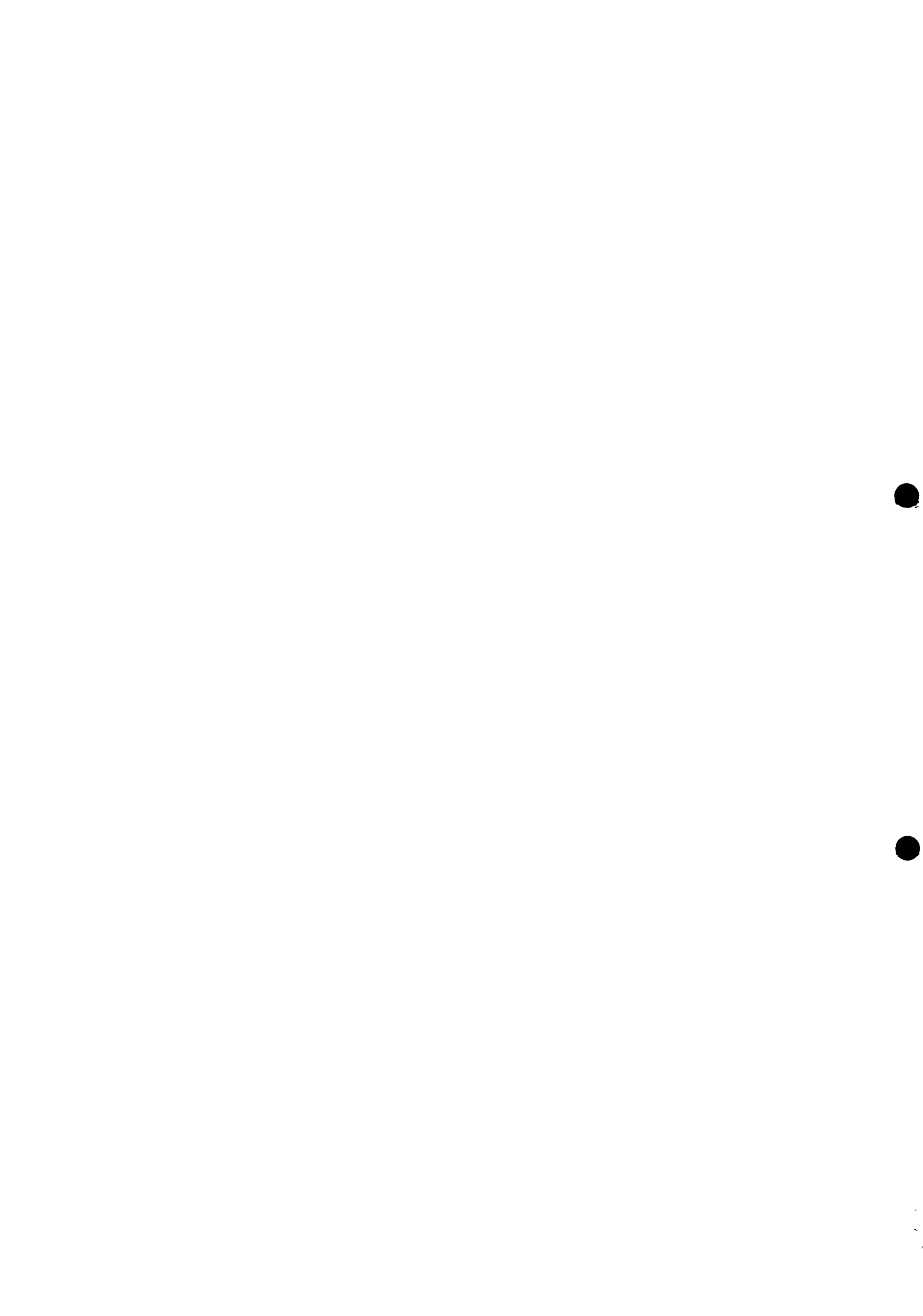
Table 3:9.

Segu Nala Population According to Age and Sex Composition.

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
0 Years	68	70	138
1 - 4 "	222	241	463
5 - 9 "	281	297	578
10 - 14 "	225	217	442
15 - 24 "	247	276	523
25 - 34 "	155	210	365
35 - 44 "	131	210	341
45 - 54 "	112	114	226
55 - 64 "	79	89	168
65 and over	91	96	187
	611	1820	3,431

The 1979 livestock censurs shows that the village had 4,667 cattle 2,131 goats and 1,501 sheep a total of 8,299 animals or a ratio of 2.4:1 animals per person.

Predominatly the soil of the village is grey to yellow hardpan soil, with shallow stony soil in the hills north of the village, and red, red brown to yellow sandy soil around Makungu Hills west of the village could be observed.



The vegetation is mostly open wooded grassland with most of the village (about 65%) being covered by woodland.

Besides agricultural production, the land use plan commonly practiced by the villagers is for grazing. It is however doubtful that livestock alone would provide sufficient ^{income} for the large population even when taking into account the convenient location of the village to cattle markets near Dodoma town as well as those of Kigwe and Maya Maya.

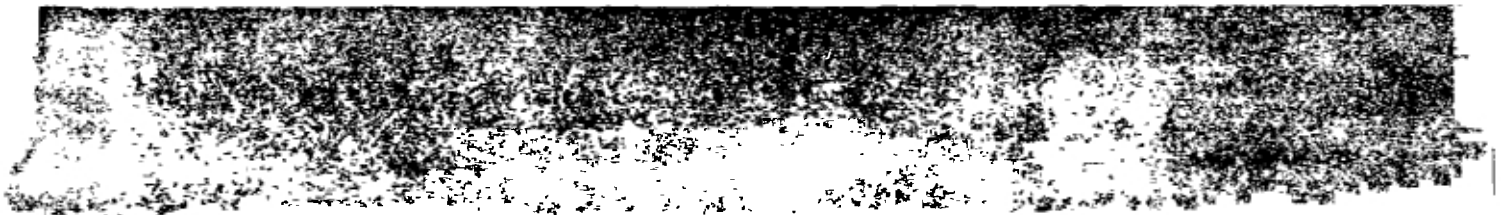
Possibly if the land is put under improved pasture, a dairy/beef project catering for the capital town would provide sufficient income. On the other hand though the village is unimportant for any vegetable gardening as there is a great scarcity of water, the village is important as it lies within the grape growing arch extending from North of Dodoma town that is Mihuji, Msalato and Makutopora then west to Mbalawala through Segu Nala, Kigwe and Mbabala to Muzi, Nkulabi, and then South to Mwitikira and East to Mimi. This area produces the largest quantity of grapes in the district, producing about 90% of the 6,609 tons of grapes produced in 1979/80 season (RDD's Office).



Although the village vine shamba is only 8 acres, grapes are mostly grown on an individual basis, more than is done in Kigwe village. There seems to be no particular reason why this village grows more grapes on individual plots than is the case in Kigwe. However, among the reasons it could be assumed that Kigwe village concentrates more on communal work as is the case in Segu Nala. For example, where^{as} in Segu Nala the villagers participate only for two days in a week for communal work, those of Kigwe village have four days for communal work in a week. Moreover Kigwe villagers seem to benefit from tomatoes and vegetable gardening, a situation which does not occur in Segu Nala.

Generally a large proportion of land in this village is set aside for general grazing, as cattle can be expected to play a major role in the village economy. At the present time the stocking rates are too high, a problem apparent to any observer. As a consequence production may be low and land is sure to deteriorate.

The reluctance to reduce stock number is related to their traditional role as a source of wealth, status and prestige and as security in time of drought. Rigby (1969) has pointed out the importance of this role and notes that the primary significance of livestock for the Wagogo lies

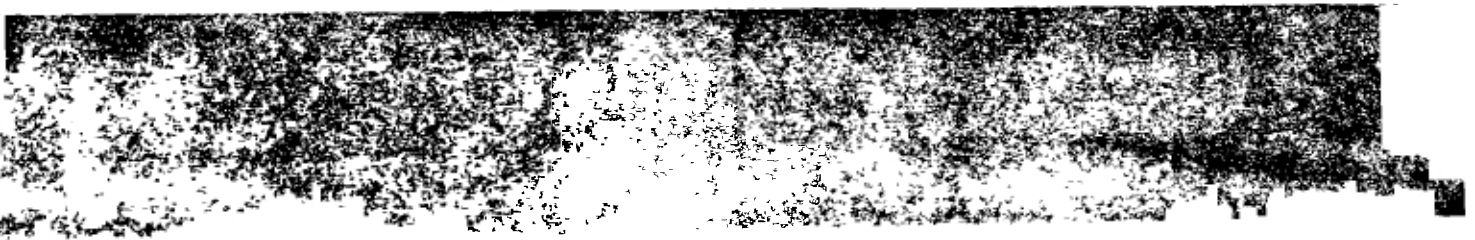




in rights and obligations in them as property, and that most Wagogo men have a primary aim of accumulating livestock. However at present, and at the most material level Wagogo especially those I talked to in Segu Wala and Kigwe are aware that the ideology involved with cattle is at variance with facts of subsistence.

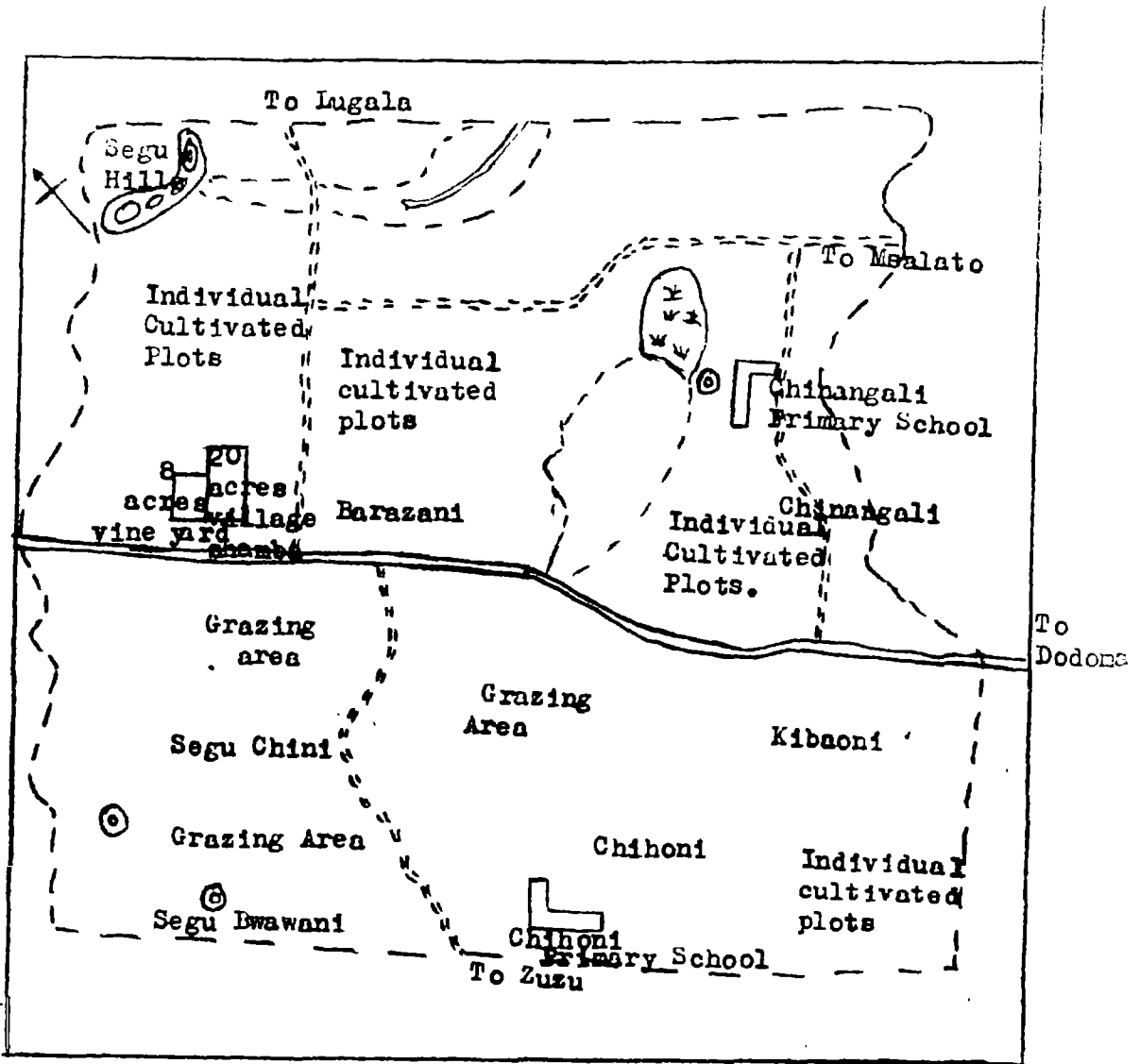
The village consists of six hamlets, Barazani, Chinangali, Kibaoni, Segu Chini, Segu Bwawani and Chihoni. These settlements are distinctively separated from each other by grazing land as well as wood and scrubs land. Barazani hamlet is where most village activities take place. There is a Primary Court, Village Shop, C.C.M. office, a Ward Office, a milling machine, a Dispensary, a slaughter and a butchery. There are two Primary Schools in the village, one situated in Chihoni and the other one at Chinangali. There is a Roman Catholic Church in Segu Chini and an Anglican Church in Segu Bwawani (See Map No. 4)

As is the case with Kigwe village the majority of the houses belonging to the villagers are traditional Wagogo houses. Like in Kigwe land in and around the village is sparsely cultivated with the typical crop of the area. Except that grape growing is practiced on a more extensive scale than in Kigwe village. Like Kigwe, Segu Wala is an agro-pastoralist village. It was registered as an Ujamaa Village on 8/5/1976.





MAP 4: SEGU NALA VILLAGE SHOWING IMPORTANT FEATURES





() Choice of Segu Nala Village as a Study Area.

In my research proposal, one aspect which was considered when choosing the villages is particularly that those villages should be located in one type of climatical and typological condition. An attempt was also made to select **clusters** of villages having similar socio-economic, ethnic and service infrastructure but dissimilar water supply characteristics. Such an approach was considered to be consistent with the aim of the research and was **intended** to permit a comprehensive and comparative study **between the two communities**. The explanation for this approach is that it is necessary to have a control group upon which observation in the village with an improved water supply project could be made. The control group in this case Segu Nala village was expected to give a background pattern of water collection and water use upon home's domestic labour time schedule as well as the water role in production and reproduction both at household as well as village level. An estimated **impact** of improved water supply was expected to be measured against this background. With this approach i.e. a two sample t-torrent of means of test it was expected to enable us to measure whether there is any significant impact upon the division of labour resulting from the improved water supply projects.



Against the above background again a number of villages were screened but most of them had to be discarded because either the villages were too small or do not fit into the same climatic or typological conditions. Moreover the socio-economic or ethnic and service infrastructure did not meet that of Kigwe. On the whole Segu Nala offered the required research situation.

(v) Water Supply System in Segu Nala

The village depended wholly on traditional wells for their domestic water supply. Three wells have been bored in the village since 1978 but have not yet been fitted with pumping machines. No particular reason was obtained from the Regional Water Engineer's Office. Only that it is within their future plan to supply the pumping machines there.

At the time of this research there were several traditional wells in each hamlet.. But I was told that these wells usually dry up by August necessitating the villagers to get their water requirement from Segu Bwawani, a distance of about 5 kilometers from the most outlying households in both Chinangali or Kibaoni hamlets. Some villagers are forced to go to the nearby village of Lugala a distance of about 6 kilometers to draw their water.



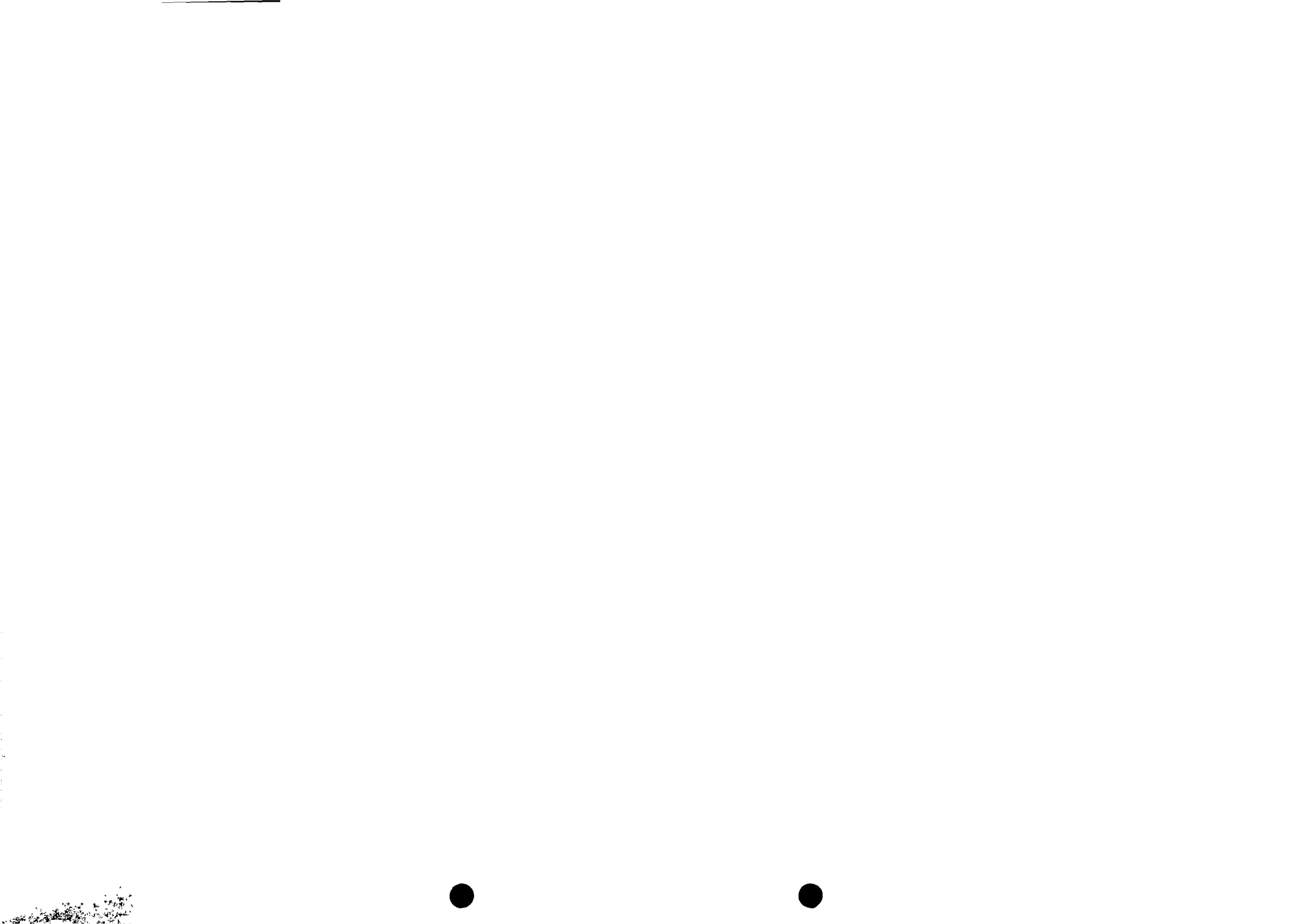
In my discussion of each village, I have estimated the ratio of livestock to persons, such an estimate is arbitrary and approximate. It may be assumed that actually every village has cattle, but this is contrary to the reality of the two villages. For example in Kigwe village only 267 households out of the total of 969 have livestock while in Segu Nala only 276 households out of 745 households have livestock.

III. METHODOLOGY

One of the on-going debates among Social Scientists to-day, is whether social scientists, their theories, tools and data collection and ^{their} interpretation can be value-free of the social scientist.

One school has it that through the use of similar methods used in natural science, that is, controlled surveys and experiments, the researcher's value judgement as well as those of the respondent can be eradicated or at least minimized. In one of their groups a group of social scientists have outlined how this is possible through an ideal interview situation using questionnaires with closed or open-ended questions (Jahoda 1968). To them, using this method, the interviewer's as well as the interviewed's biases can be eliminated. Their presupposition works from



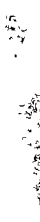


the assumption that human beings can be treated as mere objects responding positively to any scientific innovations.

In opposition to this group is another group of social scientists who argue that whatever method one uses, it is difficult and indeed impossible to get away from value. They argue that since scientists are human beings, it is very difficult to make any predictions of their behavior and responses. One such social scientist is Myrdal (1970) who argues that any student of social problems can not liberate himself from the following

(a) The powerful heritage of earlier writings in his field of study or inquiry, ordinarily containing normative notions inherited from past generations. Such norms are founded upon the metaphysical moral philosophies of natural law from which all our social and economic theories have branched off.

the influence of the entire culture, social economic and political milieu of the society where he lives, work and earns his living and his status.



(c) The influence stemming from his own personality as molded not only by traditions and environment but also by his individual history constitution and inclinations.

Added to this influence from the researcher's tradition, environment and personality, there is the respondent's perception of the situation and the way he perceives the whole research as affecting or not affecting his class interests. Should one feel that the survey will negatively affect his position, he is likely to give a verbal responses which are not a reflection of what the person feels or thinks. Deutscher (1966) has clearly elaborated how people's verbal responses do not necessarily correspond to their practice. Elaborating on this, Laing (1968) stresses the importance of context, time and space in which one research takes place. And again Herowitz (1971) explains that tools of social science are always in the hands of powerful elements in society, meaning Government officials, University Researchers, Institutional Researchers etc.

This group of social scientists are of the opinion that science cannot be a value-free science. Value in science can thus be introduced through one's attitude, personality orientation, choice of topic, tool one uses. The selection of data to be produce the ways one interprets the data collected;



Yet another debate, stems from the choice of method used in social science research. This school stresses the importance of survey method. The importance of this method is that it gives one quantitative data which can be recorded. Again this school, as I have said earlier, presupposes that human beings are more of objects whose behaviour and responses can be predicted or determined by scientific laws and innovations.

Against this school however, are people like Freire (1972) and Marja Liisa Swantz (1974) who stress the importance of participant observation in research. To them any research should involve the people to be investigated, it should be aimed at solving the problems under study and that any research should be educative to both the researcher and the people being investigated. These people have stressed that this method gives the insight into the internal dynamics one is studying and that it is useful in collecting quantitative data.

Yet a third school (one to which I agree to) is that which tries to combine both methods in what one would call a materialist participatory research approach in which the relationship between theory and practice is redefined. In this school the work of Bryceson and Mustafa (1979) and Mbilinyi 1980(a) is important. Under this



school one would use both methods applying one where he/she thinks is more convenient and useful, or both so as to use each of them as a cross check on the other. Objectives of this school is the rejection of value neutrality advocated by other schools. This school sees the role of a researcher as that of identifying him/herself with the community under study so that he/she combines the critical insight and knowledge with the understanding and resources of the local people to trigger new awareness of contradiction facing them. Here the concept of dialogue between the researcher and the community is emphasised as a reaction to the manipulation of a positive social research.

Having made this general review on methodology, I will show, in what follows and in the light of the above debate and arguments, narrate how I carried out my research, the methods used and their advantages. To start with, let me point out that the nature of the topic one chooses to study will always determine the method one uses influence of data collection. Thus, the fact that my topic of research is constructed upon the view that Domestic Water Supply Projects, play a significant role on Agro-pastoralist mode of production in Dodoma Rural District, my first step was to go through the relevant literature on the topic. The importance of this is that so that I could be versed with what has



... been written and to ascertain to what extent my
... facts ... corresponds to what had been published.
... sources of information were the various officials,
files of the RDD's Office, The Regional Water Engineer,
The Meteorological Department Station, all in Dodoma, and
different persons in the relevant fields.

In order to cross-check what I had so far amassed,
... interviewed several persons in the study area using
... questionnaires. These persons had been selected through
... stratified sampling and then through simple random
... sampling. This method will be explained more in the later
... of this chapter. In order to support my seemingly
... qualitative data with empirical and
... quantitative data, I took part in collecting **data** through
... way by participation in and observation of women's
work and other household members.

Because there was little previous sociological
... tion to work my topic from, it was necessary to
... the general peasant household mode of production
... production in the study area before giving a detailed
... tion to the structure of **the** role of water. It
... necessary to do this by comparing and contrasting
... communities, selection had been made to cover
... ving characteristics.



- (a) A village with an improved water supply
- (b) a village without improved water supply.

Such an approach was considered consistent with the aim of the research and was intended to permit a comprehensive and comparative study among the two communities. With this approach it was intended to make me to measure whether there is any significant impact upon the division of labour resulting from the improved water supply. The informal method is considered to yield information which people who have been interviewed might have held back. It was also found necessary to draw an observation list and a day's work time table for women and other members of the household. All this will be shown in the appendix.

My questionnaire (See Appendix A) is divided into three parts. The first part is to seek general household information (the size and composition, age and sex). Their relation to the head of the household. These questions are asked on the ground of both possible labour force and the need to support those who are not able to contribute labour to the household means of subsistence. Another important question in this section is question 2. The real meaning behind this question is to know the extent to which women are incooperated in the decision making in the villages. Question 3 is mainly asked to know the



effect of Government programme on primary health broadcasted over Radio Tanzania. This programme which include the handling of water especially drinking water, nutrition value and proper child care, to name only few, could be effective if majority of the people possess radios.

The second section is about water supply in the study areas. Here the most important information is to know from what kind of water source do people get their water for different uses e.g. drinking, cooking, cleaning, personal hygiene and washing. The distance between water source and the households both during dry and rainy season. Who usually draws water, if the children help, their age and sex is to be specified. The problems facing people with the kind of water supply system is also considered important. Other important factors are to find out the typical time people draw water. How water is stored (containers) whether those containers are washed and other questions as will be shown in Appendix A.

The third section deals with the general information about production and reproduction both on household and village levels. The section also includes money earning activities. Section four deals with general health problems at the household level.



(i) Sampling and Data Collection.

As I have said above, that stratified sampling as well as simple random sampling was intended to be used, both village populations were divided into four main strata. They are the poor households, who depend on subsistence production as their main occupation for satisfying both subsistence need as well as need for money generating. This stratum /^{of} the peasantry depends mostly on the sale of surplus from subsistence production, mostly in the form of dried vegetable products sold on weekly markets. Groundnuts and other farm products are also sold on minimum basis. They may also have domestic animals, most of the time /^{e.} few chickens or ducks. These people depend solely on these activities for their livelihood. There were 222 households in Kigwe and 217 in Segu Nala, classified as poor households.

The second stratum defined here as middle peasants, includes other activities in their daily work than those mentioned above. They include cultivation for cash earning e.g. vegetable gardening on medium size scale e.g. tomatoes growing in Kigwe, or grape growing in Segu Nala. They may own few herds of cattle, but usually not more than 15 herds. This stratum has in addition burning and selling of charcoal in their activities or doing odd jobs in the village. There were 334 households in Kigwe and 268 households in Segu Nala.



The third stratum /^{of} the peasantry is the rich peasant households. They are the large cattle owners mostly more than 50 herds. At the same time they do subsistence production. For this stratum, undoubtedly the most important source of cash is trading in cattle or goats. Milk is also sold, it is sold to the village creamery and for Segu Nala milk is taken to Dodoma Town to be sold to individuals. Income from these sources is more important than income from selling surplus from subsistence or cash crops. This activity implies the maintenance of a different set of economic and political relationship of a fairly extensive nature through out the communities and beyond them.

In this strata there are also some households headed by women, whose most important money generating activity is local beer brewing. Local beer is sold from the house so that a brewer's house function as a pub, or sometime it is sold in the local markets. Local beer brewing requires considerable capital outlay, and access to the labour of other women. The labour is needed both when beer is brewed and when it is carried to the markets to be sold. The women who help the beer brewers are by and large subordinated female members of their household, or poorer and more dependent women from closely related households. Women who help them in this way receive a token amount to spend on themselves.



They are also helped if they want to start brewing their own beer. Women who are frequent, good and successful brewers, are wealthy women. But it is by no means that every woman who brews accumulates enough to be considered as wealthy. 260 households in Kigwe and 220 in Segu Nala belong to this stratum.

The fourth stratum which may not be called peasants as such are those working in the service provisioning infrastructure. They are usually fully proletarianized as they get monthly salaries which is a fixed income. But they also substitute their income by subsistence production. (150 households in Kigwe and 40 in Segu Nala were found to be in this category.

Afterwards a 10% sample was randomly drawn from each stratum of the village communities. A total of 96 sample household in Kigwe and another 74 from Segu Nala were thus studied. From the total sample households, again 12 households in Kigwe and 10 in Segu Nala were randomly selected for observation purposes. At least three households were drawn from each stratum of the peasantry. These households were closely studied regarding their daily activities especially in relation to water drawing.



These households were routinely visited on a daily basis. Each time women's daily activities were observed and they were asked about the routine work of the other members of the household.

A total of seven weeks were spent in the study areas, four in Kigwe village and three in Segu Nala. The first three days in every week were spent for interviews, and the rest of the days including Sundays were spent for participatory observation on women's work schedule, and other members of the household. This routine was considered to be convenient because usually the first three days in a week for Kigwe or 2 first days in a week for Segu Nala is used for communal activities. Observation of the household activities would have been impossible during this time of the week.

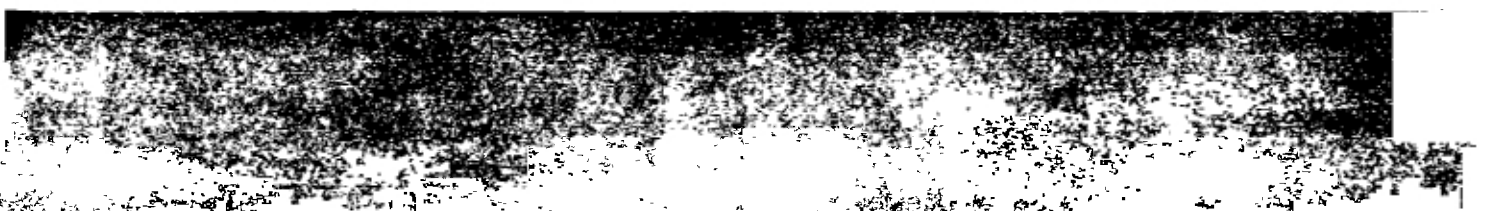
IV. LIMITATION OF RESEARCH DESIGN.

Contrary to expectation, Kigwe Village offered a relatively limited research situation on the chosen topic, because of almost non-use of water from the domestic points. It is understandable that people from the outlying areas should depend on the traditional wells because of the long distances to the domestic water points. However, in the village centre where there are no traditional wells and



few alternative sources beside the domestic water points, people were observed to be walking beyond the domestic points to get their required water. The reason for this state of affairs is that water is too salty.

Second, taking into consideration the time constraints and the limited financial resources allocated for the study, it was found impossible to study all the water supply projects in Dodoma Rural District. In fact, as the title suggests, to have a clear insight into the impact of Domestic Water Supply Projects on Rural Population in the form of production and reproduction in relation to women's domestic labour, one definitely requires much more time than the one allocated. Given such limitations the study was forced to limit its scope to only two villages in the district, one village with a water supply project and the other without.





CHAPTER IV

MAJOR FINDINGS AND DISCUSSION

Introduction.

The programme to bring fresh water supplies to the villages in conjunction with "Operation Dodoma" has been, as we have already seen, the major pre-occupation of the Regional Authority. The position reached at the end of 1980 for Dodoma Rural District has been shown in Chapter III above. The means of supplying water varies, depending on the locality. Surface source like dams are easiest to develop, but face siltation and salinity problems as indicated by attempts to introduce dams for water supply for both irrigation, domestic and livestock use. Underground water in the district seems to be the only method fit to supply water. Villages are served, in most cases, by communal stand pipe, and where the supply is other than by gravity hand or mechanically driven pumps or windmills are utilized (Mujwahuzi 1978).

In this chapter I will attempt first to give the general research findings, then I will relate these findings to water drawing system as will be shown in the two villages. In the third part I will then relate the whole lot of findings to the daily activities of the villages both at village productive base, as well as at the household level.



II GENERAL FINDINGS

(i) The Age of the Household heads (Table 4.1)

The age distribution of the household head in the two villages is shown in table 4:1. For Kigwe village one can see that 17% of 18 of the heads of households do not exceed the age of 30, and 70 or 72.9% of them are not older than 50 years. The number of very old persons among the heads of the household is relatively high, i.e. 27 of the household heads in this village or 28%.

In Segu Nala 16 or 21.1% of the heads of the household are below 30 years of age and the number of heads of households not older than 50 is 53 or 72.1% of all the household heads. The number of very old persons, among the heads of household in Segu Nala is 21 and 33%.

The median age of all sample heads of household is 40 years in Kigwe Village and 38 years in Segu Nala Village.



Table 4:1 AGE OF HEADS OF HOUSEHOLDS AMONG THE SAMPLE
IN THE STUDY AREA

(% in parentheses)

AGE IN YEARS	KIGWE	SEGU NALA	TOTAL
Under 21	4 (4.2)	2 (2.2)	6 (3.5)
21 - 25	4 (4.2)	2 (2.7)	6 (3.5)
26 - 30	9 (9.4)	12 (6.2)	21 (12.4)
31 - 35	8 (8.3)	6 (8.1)	14 (8.2)
36 - 40	15 (15.6)	14 (18.9)	29 (18.2)
41 - 45	16 (16.7)	8 (10.8)	24 (14.1)
46 - 50	12 (12.5)	9 (12.2)	21 (12.35)
51 - 55	7 (7.3)	9 (12.2)	16 (9.4)
56 - 60	6 (6.2)	6 (8.1)	12 (7.1)
61 - 64	5 (5.2)	1 (1.4)	6 (3.5)
Above 65	10 (10.4)	5 (6.8)	15 (8.8)
Total	96 (100%)	74 (100%)	170 (100%)

(ii) Sex of the heads of Households (Table 4:2)

80 of the heads of household heads or 82.3% of the total sample in Kigwe Village are male. The percentage figure for Segu Nala is 91.6% or 68 households. The number of female household heads is small in both villages, though slightly higher in Kigwe being 16 or 17.1% of the sample households. In Segu Nala the numbers of female household heads in only 6 or 8.4%



Table 4:2 SEX OF THE HEAD OF HOUSEHOLD AMONG THE SAMPLE
IN THE STUDY AREA

(% in Parentheses)

SEX	KIGWE	SEGU NALA	TOTAL
Not stated	-	-	-
Male	80 (82.3%)	68 (91.6%)	148
Female	16 (17.4%)	6 (8.4%)	23
Total	96 (100%)	74 (100%)	

(iii) Number of Children (Table 4:3)

Included in the study area are 512 children; 296 in Kigwe village and 216 in Segu Nala village. This represents an average of 3.2 children per household. For the distribution of children in different age group we can refer to Table 4.3

One can see that very small children do not occur so frequently per household as those between 5 - 9 or 10 - 16. In both villages the number of children per household declines rapidly after the age of 16 years old being 28 between 17 and 24 with only one child after the age of 24 in Segu Nala. In Kigwe Village the number fall from 99 to 35 between the age groups 10 - 16 and 17 - 24 with only 10 children above 24.



The possible explanation for this is that after the age of 16 which is also after the completion of primary school education youth may move from the villages to urban areas to look for jobs or they continue with school or, especially girls may marry.

The relationship between median age of head of households and percentage of children in lower age group in the two villages ought to be a positive one - young families are likely to have small children than elderly family. If

the relationship between median age of household heads and the percentage of children in different age groups is illustrated for the two villages, it is found out that the youngest group has a higher percentage of small children than the elderly group.

Table 4.5 NUMBER OF CHILDREN IN AGE GROUP IN THE SAMPLE

AGE	HOUSEHOLDS		TOTAL
	KIGWE	SEGU NALA	
	(% in Parentheses)		
0 - 4	56 (18.9)	48 (22.2)	104 (20.3)
5 - 9	96 (32.4)	69 (31.9)	165 (32.2)
10 - 16	99 (33.5)	70 (32.4)	169 (33.0)
17 - 24	35 (11.8)	28 (13.0)	63 (12.3)
25 and above	10 (3.4)	1 (0.5)	11 (2.2)
	296 (100%)	216 (100%)	512 (100%)



(Table 4:4) OTHER MEMBERS OF THE HOUSEHOLD

A total of 98 persons were classified as other members of the household 56 were found in Kigwe Village and 42 in Segu Nala village. About 65% of the other members of the household in both villages or 37 in Kigwe and 21 in Segu Nala village are probably consist largely of school attenders. Few very old people are also found as other members of the household mostly grand parents.

TABLE 4:4. OTHER MEMBERS OF THE HOUSEHOLD

(% in Parentheses)

AGE	KIGWE	SEGU NALA	TOTAL
0 - 4	1 (1.8)	6 (14.3)	7 (7.1)
5 - 9	15 (26.8)	12 (28.6)	27 (27.5)
10 - 15	13 (23.2)	8 (19.1)	21 (21.4)
16 - 20	9 (16.0)	1 (2.4)	10 (10.2)
21 - 25	1 (1.8)	4 (9.5)	5 (5.1)
25 - 30	2 (3.6)	1 (2.4)	3 (3.1)
31 - 35	2 (3.6)	-	2 (2.0)
36 - 40	1 (1.8)	-	1 (1.0)
41 - 45	2 (3.6)	2 (4.7)	4 (4.1)
46 - 56	-	-	-
51 - 55	-	-	-
56 - 60	-	-	-
61 - 64	5 (8.9)	6 (14.3)	11 (11.2)
65 and above	5 (8.9)	2 (4.7)	7 (7.2)
Total	56 (100%)	42 (100%)	98 (100%)



II RELATIONSHIP BETWEEN HOUSEHOLD INFORMATION ANDWATER DRAWING.

Water drawing has always been considered women's work, but through this research it has been established that children, especially girls play a big role in this activity before they are in their teenage years. This aspect was found out to be true in both villages. Single men have to draw water for themselves (three among the Kigwe sample and two among the Segu Nala village). Some men do this as money earning activities (among the sample two men from Kigwe were found out to be doing this). Usually the men have a different style of carrying water - two buckets or two debes (oil tins) are carried on a stick over the shoulders (nsega nsega). In both villages it was found that up until the age of 15 years boys make an important contribution to the task of carrying water for the domestic use. Small boys and girls or women both young and old on the contrary carry water containers on their heads.

The standard containers used in both villages for drawing water are plastic buckets which holds 20 liters aluminium buckets which can hold 15 liters are also used. Young boys and girls may not fill them completely so as to reduce the weight. Some people use smaller containers such as smaller buckets of 4 liters different sizes of guords, the biggest I have seen can carry 12 liters of water. These smaller containers were observed to be used mostly by older women and young children.



For the general calculation the water containers may be divided into four main categories in both villages

- (a) Plastic buckets 20 liters
- (b) Alluminium buckets 15 "
- (c) Large gourds 12 "
- (d) All small containers 6 "

Water is generally drawn before sunrise and a little longer there after, roughly between 6:00 a.m. and 8:00 a.m. and again in the evening; between 5:00 p.m. and 7:00 p.m. These periods are somehow related to the main period of water use in the households namely cooking. Usually among the Wagogo people are used to getting two main meals during the day. In the morning people may eat a full dish of ugali with green vegetables followed by some amount of milk among the cattle owners. A second meal is taken in the evening. This is because many people are away during the day. For example cattle herding is a full day activity, charcoal burning or fire wood gathering may also take a whole day. Therefore one needs to get a full meal in the morning to be able to stay out. Most women collect firewood twice a week. Charcoal burning activities is a full week's work for many men in the study area.

Throughout the day older women or children were observed drawing water. It was learned that they mostly draw the water for washing or bathing small children. In Kigwe village



it was observed that at such a time those drawers get their water mostly from the domestic water points. The total amount drawn during this time is certainly much less than that drawn early in the morning or later in the evening.

(i) Waiting Time

Normally it does not take long for a water drawer to fill her/his container. With a traditional well a person needs to go down the well fill the container and comes out. It was observed that usually it takes only some few minutes to do this. However, and this was only observed in Kigwe Village among the water drawers who usually use the ring wells. These wells are those at the railway station or the second one east of the railway station, as shown in Map No. 3 in Chapter III. In this cases one would then need about 5 minutes to fill a bucket of 20 liters. This is done by using a four liter container usually tied at the end of a rope to get water from the well. One needs to do about five to six scooping of water to fill a bucket. It was observed that three or four people may do this simultaneously. At the domestic water points in the same village it was observed that it takes between half a minute and two minutes to fill a bucket. The water pressure was observed to be always high. This may be due to the seldom use of the domestic points. In the whole study area, no observation was made of more than five people at a water point at any one time.





However I was told and confirmed through the questionnaire that the situation is very different during the dry season. When most of the wells (traditional) have dried up, people would then start to queue for water, or travel long distances to get their domestic water requirement. At this time of the year, most households in Kigwe would turn to the domestic water points for their water needs except for drinking or cooking ugali. I was told that one cannot cook ugali using salty water because ugali will never get thoroughly cooked. In fact this point has some truth in it. Salty water needs higher temperature to get boiled. It is understandable, with the scarcity of fuel in the study area that people assume salty water is bad for cooking ugali. On the whole, among the sample households of both villages 65% in Kigwe and 75% in Segu Nala reported that long queues occurred during the dry season.

(ii) Water Storage

No difference of storing water was observed in the two villages. Drinking water is usually stored in a special container (ntungi) usually covered with something. A ^u bag or "kipeyu" is usually left nearby for drinking water.

For general household use water may be used directly from the buckets or stored in various types of containers. The total volume of water stored determines the household ability to fetch water. In the households where there are no



children helping in the activity the volume of water is usually very limited. In most cases water drawing does not correlate with wide variety of water use, rather it correlates with labour force available. Differences of water volume appeared among the different strata of the peasants.

Most of the containers for water storage are kept inside the houses. On the average they are cleaned twice a week. The types of storage containers apart from storing drinking water are shown in the following table (Table 4:5)

Table 4:5 TYPES OF STORAGE CONTAINER

Type of Container	No. of Households and %	
	Kiswe	Segu Nala
Earthen Pot (Chungu)	58 (60.4%)	34 (45.9%)
Metal drum	24 (25%)	28 (37.8%)
Debes or Plastic buckets	9 (9.4%)	9 (12.2%)
Gourds	6 (5.2%)	3 (4.1%)
Total	96 (100%)	74 (100%)

It was found out that households do use various types of containers for water storage, but those stated were mainly those commonly used.



(iii) water Use

It was expected that since most of the water sources from the two villages ^{are} from untreated sources (traditional sources) the publicity around the cholera epidemic and primary health care may have induced people to boil their drinking water.

A question was included in the questionnaire to find out whether people boil their drinking water. It was found out that only 11 households in Kigwe and 9 in Segu Nala stated that they boil their drinking water. These numbers represents 10% in Kigwe and 12.2% in Segu Nala Village. Many reasons were given for not boiling the water. Many women 48 (56.5%) in Kigwe or 40 (61.5%) in Segu Nala said that they did not have time to do it. Other reasons given included "boiled drinking water has bad smell 19 household a (22.4%) in Kigwe or 12 household (18.5%) in Segu Nala stated this. Fuel is a problem was given by 10 or (11.7%) of the household in Kigwe and 10 or (15.4%) of the household in Segu Nala. The rest of 8 or (9.4) in Kigwe village and 3 or (4.6%) in Segu Nala did not have any particular reason.



Table 4:6: Reason Given by the Household for Not Boiling Drinking Water.

(% in Parenthesis)

Reason	Kigwe	Segu Nala
No time	48 (56.5%)	40 (61.5%)
bad smell	19 (22.4%)	12 (18.5%)
lack of fuel	10 (11.7%)	10 (15.4%)
no reason	8 (9.4%)	3 (4.6%)
N	85 (100%)	65 (100%)

Water for washing clothes, utensils or bathing is usually brought to the household, although some people take their clothes or take their baths near the water source. People do not wash or bath at the water sources but fetch water in a bucket and wash some steps away. Water used for washing clothes at the source has been included in the calculation as far as possible. But for those who takes their bathes at the water point, calculation has not been possible, because bathing usually may take place in seclusion during the late hours in the evening or boys and men may take their baths when watering their animals. The only calculation of water for bathing is that which is brought home for that use. Ninety per cent of the sample in both areas say they take their bath at home.



Table 4:7. Place For Washing Clothes or Bathing

(% in Parentheses)

	Kigwe	Segu Nala
At home	82 (85.4%)	54 (7.3%)
At the water Sources	14 (14.6%)	20 (27%)
N	96 (100%)	74 (100%)

These seems to be higher percentage of people washing their clothes at the water points (sources) in Segu Nala Village then in Kigwe. This may be associated with alternative sources of water available in Kigwe Village.

(iv) Water Consumption as Calculated from the Questionnaire.

The amount of water which was stated by all household over the four weeks period in Kigwe and three weeks in Segu Nala was first added and divided among the members of the household to get an average water consumption among different households. The average was then added together and divided among the sample household (table 4:9) to obtain the average daily consumption per capita in each village. This was found, to be 11.23 liters in Kigwe and 9.45 liters in Segu Nala with a range of 3 - 39 liters per capita. The relatively higher per capita of water consumption in Kigwe can be explained in relation to wider choice of water sources the village^{has,} as well as abundance of both surface and ground water available there (Kigwe village lie in the extension of Bahi Swamp).



Water consumption varies among different strata of the peasantry as will be shown late on in this chapter. There is a great likelihood that higher water consumption associates with the availability of labour force within the peasant household. A higher quantity of labour force was at the disposal of well to do strata of the peasantry, while older children among the poor households leave the parental household as soon as they are old enough to try their luck on the labour markets. Children from rich and middle strata of the peasantry remains at the parental home until they marry or are married off.

Table 4:8. Water Consumption as Calculated From the Questionnaire.

(% in Parentheses)

VOL. OF WATER	NO. OF HOUSEHOLDS		TOTAL VOLUME OF WATER	
	Kigwe	Segu Nala	Kigwe	Segu Nala
(1) Under 0 litters	49 (51.0)	39 (52.7)	367½ Lts.	298 Lts.
(2) 11 - 15 "	28 (29.1)	13 (17.5)	280 Lts.	167 "
(3) 16 - 20 "	13 (13.5)	19 (25.6)	248 "	148 "
(4) 21 - 25 "	3 (3.1)	1 (1.4)	91 "	25 "
(5) 26 - 30 "	1 (1.1)	- ()	30 "	- "
(6) 31 - 35 "	1 (1.1)	1 (1.4)	33 "	30 "
(7) 36 and above	1 (1.1)	1 (1.4)	39 "	32 "
N	96 (100%)	74 (100%)	1088½ "	700 "



(v) The Direct Measurement of Water Consumption.

The water consumption among the selected household for observation was measured, for I spent two days observing activities among these families. The total amount of water consumed in the two days of observation was added up. It was then divided by size of household and then divided again by number of household observed to obtain the true average daily consumption per capita. This was found to be 15.2 liters in Kigwe and 13.8 liters in Segu Nala, with a range of 8 - 20 liters per capita. The difference between the per capita consumption obtained by questionnaire and that by true measurement was found out to be 3.97 liters in Kigwe and 3.35 in Segu Nala. The most likely explanation of this phenomenon is that a lot of women do not include the amount of water brought home by small children when asked about water consumption in the questionnaire. It also indicates the importance of using both questionnaire and observation to have an in depth case study. It is quite obvious from this study that questionnaire alone has some limitation in obtaining the true picture of any given situation.



Table 4:9. WATER CONSUMPTION MEASURED AMONG THE SAMPLE
DRAWN FOR OBSERVATION

(a) Kigwe Village

Size of Household	First Day	Second Day	Total	Average Per Capita.
4	75	85	160	20
7	120	121	241	17.5
7	100	124	224	16.0
8	108	100	208	13.0
8	116	116	232	12.0
2	40	40	80	20.0
7	70	74	154	11.0
2	40	40	80	20.0
3	53	43	96	19.0
4	20	20	40	10.0
7	112	112	224	16.0
1	20	20	40	<u>20.0</u>
				182.5

$$\begin{aligned} \text{The true per capita} &= 182.5 \div 12 \\ &= 15.2 \end{aligned}$$



(b) Segu Nala Village.

Size of Household	First Day	Second Day	Total	Average Per Capita.
4	80	80	160	20.0
1	20	20	40	20.0
2	40	40	80	20.0
5	70	80	150	15.0
6	40	40	80	8.3
7	70	70	140	10.0
7	90	92	182	13.0
9	100	116	216	12.0
9	90	90	180	10.0
4	40	40	80	<u>10.0</u>
				138.3

$$\begin{aligned} \text{The true per capita} &= 138.3 \div 10 \\ &= \underline{13.8} \end{aligned}$$

The total water consumption per household of course increase with the size of the household. This relationship has been shown in the two figure above. Yet it can be seen that the relationship is not exactly in stright line. In all cases in both figures on person is shown to be using 20 liters a day and two persons seems to be using 40 liters. From there on, as the size of the household increases, there is not a corresponding increase in the water volume. On the whole one can say that there is a rapid decrease in the volume of water per capita consumed with the increasing size of household.





There seems to be a need for more in depth study to find out this phenomenon. However it is possible to suggest that in cooking, cleaning and washing for more people at the same time water is used more efficiently and therefore less is needed per capita. Other factor that may play a part is that larger households usually contain a larger proportion of small children in which case they are not included in the labour force for drawing water. There is evidence from this research that labour is the constraining factor.

III. WATER DRAWING IN RELATION TO OTHER ACTIVITIES
IN PEASANT HOUSEHOLD

This section of the chapter considers the relationship between the division of labour by sex and age and the generation of use values as well as exchange values among the agro pastoralist small holders, the Wagogo in Dodoma Rural District.

Table 4:10 presents the matrix of participation in the principal activities of the peasant household aggregated according to the family member charged with the primary responsibility for directing and carrying out the activity.

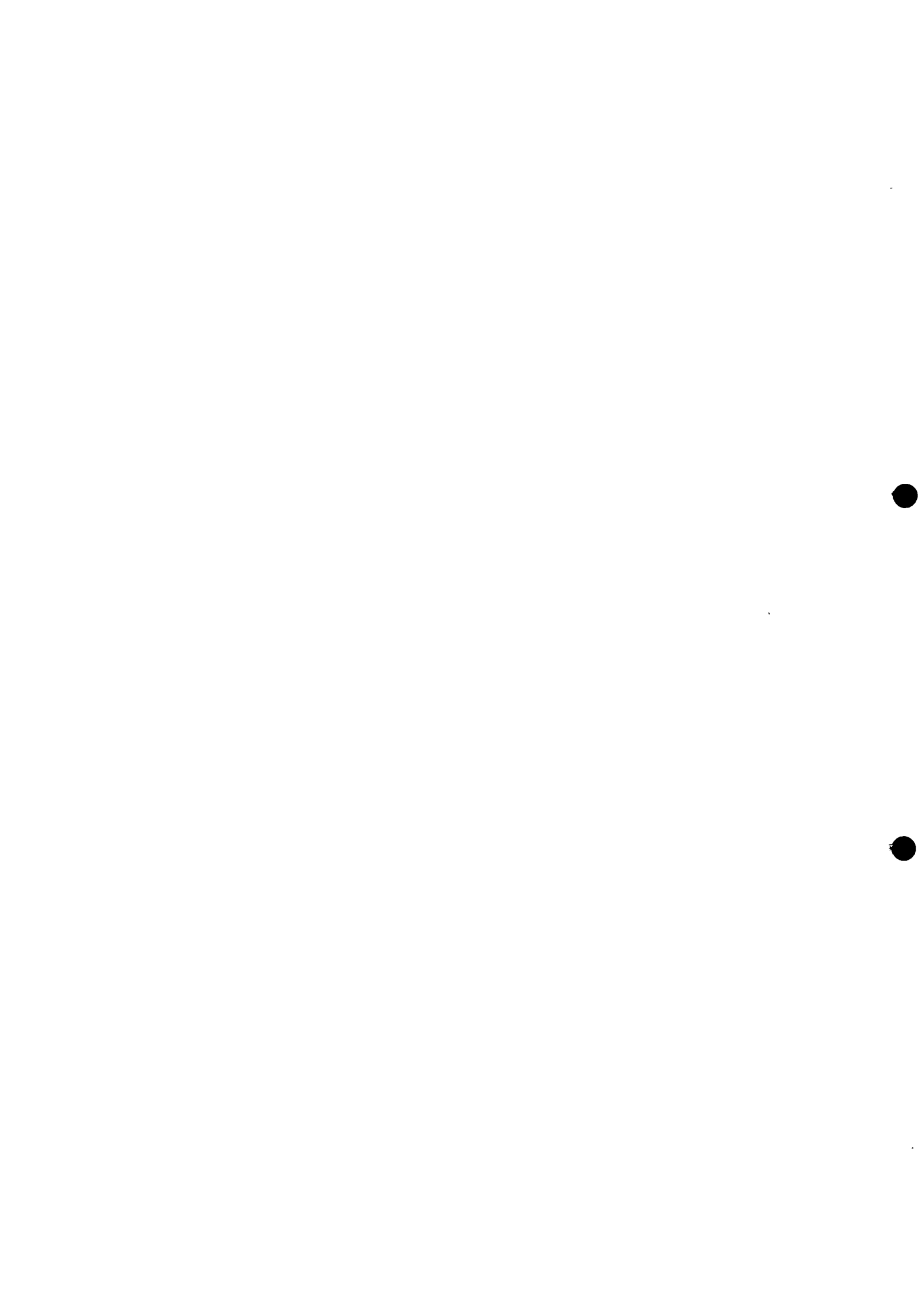


Table 4:10. FAMILY ACTIVITIES ACCORDING TO THE PRINCIPAL
FAMILY MEMBER RESPONSIBLE FOR THE ACTIVITY.

Activity	Wife Principal Responsibility		Husband Princ. Responsibility		Children's Princ. Responsibility		All Family Members Responsibility		Total %	
	Kigwe	Segu Nala	Kigwe	Segu Nala	Kigwe	Segu Nala	Kigwe	Segu Nala	Kigwe	Segu Nala
(a) Household Maintenance										
Cooking	83.4%	84.6%	-	-	13.0%	12.8%	3.6%	2.6%	100%	
Child care	83.3%	83.9%	-	-	14.8%	14.9%	1.9%	1.8%	100%	
Water Drawing	73.3%	78.8%	1.8%	1.6%	18.3%	18.2%	1.6%	1.4%	100%	
Fire Wood collect.	58.1%	58.7%	16.2%	16.1%	19.5%	19.5%	6.2%	6.1%	100%	
(b) <u>Use and Exchange Value Production</u>										
Cultivation	65.4%	65.0%	17.2%	17.2%	7.8%	7.8%	4.7%	4.8%	100%	
Anim. Production	4.4%	4.3%	61.9%	62.0%	22.9%	22.8%	10.8%	10.6%	100%	
Other money earning activities firewood charcoal selling	24.0%	24.0%	73.4%	74.9%	-	-	2.6%	2.1%	100%	

N = 96 74

population = 27 and 21.

Note.

The category All family Members include cases where wife and husband share responsibility for the activity where other members of the household or parents and children carry out the activity with equal responsibility.



(i) The Maintenance of the Households

In the study areas the production of use value for the maintenance of household labour power on a daily basis is primarily a female activity and the responsibility of the wife in overwhelming majority of the household. In more than 80.9% of the households wives take full responsibility for cooking and cleaning the houses, although in some of the households mothers and daughters share the responsibility for these activities. Up until the age of 9 or 10 daughters are complements/^{to} their mothers labour time schedule. After that age young girls begin substituting for their mothers on a meal by meal basis, and by their mid-teenage years, may replace the mothers in cooking activities freeing her completely for other kind of work.

Meal preparation, water fetching and fire wood collecting are the most time intensive maintenance activities. The average household of 5 members dedicates a total of 4.2 hours of labour time daily to cooking and cleaning the house after the meal. Water drawing takes about 3.6 hours of labour time daily. Firewood collection is generally weekly activity, consuming an average of 6 hours of labour time per week.

For the sample as a whole, household maintenance activities take up a total of 60 hours of family labour time per week. There is little variation by family size or between the two villages. In large family it was however noticed that



more children spend a shorter amount of time on each activity freeing the mother for other work. In a household where there is a grandmother she may take charge of all daily maintenance activities again freeing the mother for income generating activities. This was found out to be the case among the beer brewers. There is no significant difference in the time dedicated to household maintenance activities by different peasant strata. Among all strata of the peasantry daily maintenance activities mainly fall in the female domain. In more than half of the household wives carry the largest burden for household maintenance although the participation of children is important particularly that of daughters.

The pattern of children's work contributions by different sex and age groups show some variations with the peasant strata, and mostly related to the specific conditions in the different households. In middle and rich peasant households boys seldom help in the housework maintenance but they may assist in cultivation and herding. In poor peasant household boys take care of young siblings and a few assist in firewood collecting. Generally no boys over 15 do any of this work.



(ii) The Production of Use Value.

In both villages, and among the middle and rich strata of the peasantry, men are considered either as cattle herders or cash crop producers. Women on the other hand are considered subsistence producers. But among the poor stratum both men and women have equal responsibility toward subsistence production.

As table 4:10 above indicates, if the whole peasantry is put together there is an indication of mothers (wives) contributing about 65% of labour needed in subsistence production. Father's (husband) direct subsistence production is only around 17.5% where no grown up children are present. If teen age children are living at home after their primary school education they will contribute only 8% of the household labour time. However around 4.8% household contribute equally toward subsistence production. This aspect was found to be concentrated more among poor stratum of the peasantry.

However when the different strata of the peasantry were observed closely, it is found out that among rich and middle class strata of the peasantry the mother (wife) and her children whether they are still in school or have finished the Primary School education contribute fully towards subsistence production while men either do animal herding or cultivation for cash earnings.



In few household, headed by women, only 10 in number among the whole sample of 170 household, (nine of them professional beer brewers and one professional teacher who get a monthly income) subsistence production is attained through both household and/or hired labour. These households represent only 5.9% of the total sample. (170 households)

We have seen in chapter II above that access to the means of production for subsistence is key to the process of social differentiation among peasantry. Access in this sense means land and labour.

Land is distributed to the household head in both study areas by the Village Governments (a minimum of 3 acres for subsistence production and another acre for cash crop is assign to each household). However an individual household may acquire land on the outskirts of the village if it wishes. Usually it is only through labour availability both from household and/or hired labour that a peasant household is able to have a plot in this part of the village. In this case, the rich or middle strata monopolise these extra plots. On the other hand it is the poor stratum who usually sell their labour power for wage or kind, necessitating them to produce less for their own subsistence.



The following six case studies will indicate the importance of labour availability in production among peasant households.

(a) Case Study Number One

This is a female headed household belonging to the rich stratum of the peasantry. The head is around 45 years of age. She has never legally married, but has lived with different men in Dodoma town when she was between the age of 18 and 30. She does not have any children of her own, though she has brought up two of her brother's children (12 and 14 years old girls.) who attend the Primary School in the village. Other dependents in her household are her parents of around 65 and 70 years of age and two women whom she refers to as relatives (jamaa). These women are in their 30s.

She told me that she was born in a poor family somewhere in Manyoni District now Singida Region. However the family moved to Kigwe when she was about 12 years old because of a bad famine in her former village.

At the age of around 15 years of age she told me that she went to Dodoma Town to look for a job as an ayah. She was employed by one Asian who paid her Shs. 15/= per month and housed her.



At the age of 18 she left the job and started living with a man. Until she was 30 years of age she lived with four other men. At the age of 28 she started working for a lady who was brewing beer in town, work she did for two years and was able to accumulate Sh. 200/=.

At this time she went back to Kigwe, improved her parents house with some of the money and settled down started brewing her own beer. She told me that she has been successful ever since she came back to Kigwe. With the money from beer selling she has been able to build herself a big house. (four rooms with a corridor in the middle) The house is built of dried bricks with a corrugated iron roof. She seems to have no problem in maintaining her household.

On subsistence production, she told me that she was never assigned a plot by the village Government but inherited her parents plot who are now under her care. This plot is about 3 acres planted with millets (uwele) with different kind of local vegetables few cassava and potatoes. She told me that she has got another plot of about 5 acres on the outskirts of the village which she cleared with the help of hired labour and has planted with millets and groundnuts. She told me that she does not sell any products from her plots - they are consumed entirely by her household.



Generally she uses hired labour for her cultivation, plus planting, weeding and harvest ^{are done} by the two women relatives and if possible the two children.

On household maintenance I was told that most of the time her mother does the cooking. Water fetching for the household use is done by the two children after school. However water for other use like beer brewing is generally brought by hired labour, mostly a man, and sometimes the two women help also. Firewood for the household use is usually collected or charcoal is bought. But firewood for beer brewing is wholly bought.

Case Study Number Two

A polygamous household head, he belongs to the rich peasant stratum. He is around 55 years of age, married to three wives. His oldest wife is around ^{his own age,} 35 years old and his second wife is around 35 years old and his third wife is around 28 years old. There are a total of 28 children in his household. Two girls have been married off and two sons have married with a few children each but they still live in the household. Other dependents are his younger brother of 30 years of age and his family. The children of the brother are included in the number of children above. The married sons and younger brother are referred to as dependents because they have not been officially assigned herds of cattle. On the whole there are 10 grownup people in the household.

He told me that he has around 200 herds of cattle inherited from his dead father . They were three brothers, and each brother has now established his own homestead in different parts of the District. His youngest brother who is staying in his household was not born yet at that time. Being the eldest son himself it was only normal to take care of him

On subsistence production, I was told that each married woman has her own fields to produce millets, groundnuts and other vegetables. The fields have been acquired through the husband as a head of a household. The women do all the work in subsistence production, usually helped by their children if they are old enough. Grown up men, on the other hand are only responsible for animal herding or going to different cattle markets to buy and sell herds.

On close study of the household, it was found out that no woman produced enough for subsistence living. The household head usually sold a few cattle each year and distributed money among his dependents for household needs.

Household maintenance is done by each married woman helped by her own children if they are old enough. No hired labour is used in either subsistence cultivation or animal herding. It seems that the household has enough labour resource.



Case Study Number 3

This is a male headed household who belongs to the middle peasant stratum. He is around 40 years of age married to a single wife of about 35 years. They have six children all living at home. They are between 18 and 2 years of age. The eldest child who is a girl has finished her Primary School Education in the previous year, three children are attending the Primary School in the village and two children have not yet gone to school. There are no other dependents in this household.

On subsistence production, I was told that mostly it is the wife who is responsible for cultivation of the staple food. Her husband usually helps especially during cultivation. However the husband's work in cash crop production, mostly in the form of tomato cultivation is important. The children's work in subsistence production is also very important. The eldest daughter usually shares the work with her mother and the school going children help during weekends.

Household maintenance is also shared between the mother and children. Cooking is mostly done by the eldest daughter. Firewood collection is done by the mother, water drawing is shared by the mother and children.



The household does not depend on subsistence production. Food is also bought with the money acquired through tomato sale

Case Study Number 4

It is a monogamous household, which belongs to the middle stratum of the peasantry.

He is about 39 years of age, his wife is around 35 years old and they have 8 children, all living at home. A boy and a girl have completed Primary School education. Three children are attending the primary school, and three others have not yet started going to school, the youngest being six months while the oldest is 19 years old.

Subsistence production is met through cultivation of millet, groundnuts, maize, cassava and sweet potatoes. Mostly the wife and her daughter are fully responsible for this activity, although the school going children sometimes help during weekends and vacation. I was told that sometimes the household brews beer so that other people may be invited to attend work on cultivation. For this reason the household is solely dependent on production of the main staple crop. Though some non farm food produce are bought. Household maintenance is mostly shared between the eldest daughter and the mother. The school going children also help mostly in water drawing, child care and firewood collecting.



The elder son who has completed his primary school education, mostly does the herding. He is also helped by a 13 year boy during weekends or vacation. The father is mostly concerned with charcoal burning. He does this through out the week. With the money earned he buys household necessities or spends the money anyhow he wishes.

Case Study Number 5

A monogamous household belonging to the poor stratum of the peasantry. The household head is around 40 years old. His wife is around 39 years old. They have six children but two elder children have left home and are living and working in Dodoma Town. Two of the children who are still at home attend the primary school and two are too young to go the youngest being two years.

In this household, the maintenance of the home falls under wife's domain. She cooks, draws water, collects firewood and does child care. She is helped by her two school going children after school during weekends and vacation. Unlike the rich or middle peasant household subsistence production is joint work between husband and wife. There is an equal contribution to this activity from male and female work. Children especially the ones who attend school help in this activity. This aspect can only be understood in relation to how vital subsistence production is in poor peasant household.



Substitutes for subsistence production can only be achieved through the sale of labour by the household head to a more well-to-do peasants. In this household, during cultivation season, the husband cultivates for other peasants in the afternoos, after he has done work in his own plot during the morning hours.

From this it can be concluded that in poor stratum of the peasantry the reproduction of the peasant household is shared equally between husband and wife. While the wife does the household maintenance, the husband sale his labour in exchange for cash, which is mainly used for the household maintenance.

Case Study Number 6

This is a female headed household, of about 48 years old. She is a teacher at the Primary School in the village and therefore fully proletarianized. Her household consists of herself and a 15 year old son who attends the primary school.

In this household the maintenance of the household is shared between mother and son. Where mother mostly cooks, the son draws water, cleans the house and the surroundings.

The household cultivates for subsistence production, and hires labour of poor peasants, but the household head and the son also contribute some amount of labour towards



this activity. The main staple food is never bought. Other necessities are bought using the monthly income.

To summarise the above six case studies we can safely say that there is a division of labour by sex in the tasks which encompass subsistence production revealing the importance of women's participation in cultivation for subsistence production as well as household maintenance is vital. On the other hand in cash crop production, other money earning activities and cattle herding or wage labour is considered men's work. There is a significant difference by peasant strata not only in women's relative participation as compared to men's, but in the tasks in which peasants from different strata are participating. Whereas women are the sole cultivators of subsistence production in middle and rich strata of the peasantry, in the poor stratum the work is shared by every able bodied person, especially husband and wife.

(iii) The Production of Monetary Value.

Only 30% of all households in the whole sample considers cultivation to be an income generating activity. The majority of these are middle peasants households. On the other hand cultivation comprises only 18% of the farm generated monetary income of poor peasant households.



In an overwhelming majority of the poor peasant households, women are responsible for the marketing of whatever produce is to be sold. This is usually done on an extremely small scale. A woman may carry a small sack of dried vegetables to sell in small piles at weekly markets. For Segu Nala Village, these weekly markets take place near Dodoma town every Saturday. This is also cattle market day. In Kigwe, these market days take place every Wednesday in the village. The income generated from these sales is then used to purchase the weekly necessities e.g. salt, soap, cooking oil, paraffin etc. In contrast among the middle peasant households the bulk of the marketing is carried out at a whole sale level, and is done primarily by men. For example, groundnuts, tomatoes, grapes and vegetables are sold in containers like tin (debes) or buckets etc. These containers usually fetch higher prices and less time waiting for the products to be sold. Tomatoes on a whole-sale basis are sold twice daily to the passengers' train which goes through Kigwe village - one going up country, the other one coming down to Dar es Salaam.

Among the middle stratum of the peasantry charcoal burning for sale is also an important activity for money earning. This activity is usually done during the dry season when people cannot cultivate tomatoes or other vegetables because of water scarcity.



In rich peasant households, cattle sale is the most important money generating activity. Cattle by-products like milk/cheese are also important. This stratum of the peasantry do not depend on sale of herds from their own households. They usually buy cattle from individuals in more remote areas and then sell them in cattle markets at higher prices. This activity seems to be very important among these people.

Cattle herding takes an average of 6 hours daily. Livestock must be taken out for grazing at around 8:00 a.m. By 12:00 noon they must be watered. Because of intense heat the herds usually rest under baoba trees after they have had a drink of water until about 3:00 p.m. when they are again taken for grazing. Normally at around 5:00 p.m. the herds are brought back home to be milked.

Thus cattle herding is the second most time - intensive family activity, after general household maintenance. An average of 42 hours a week are dedicated to cattle in the two samples. The amount of time dedicated to this activity is closely correlated with the size of the herd and the amount of labour force available. With a small herd of up to 30, two people may spend a total of 35 hours a week on average for animal care with a herd twice the size (60), the time needed by two people would be 42 hours on average. Households with 120 herds or more require two people about 47 hours a week on average for animal care.



There seems to be a rapid increase in labour requirements with increasing size of herds. The most likely explanation for this phenomenon is that there is an economic scale at work. One can easily see that herding for more cattle is more profitable. In fact the time used for animal care for small size herds should not be different from that of large size herds. But because of water scarcity in the district, more hours of labour is necessary to water the herds.

As in the case of cultivation, animal production is considered as an income generating activity by only 30% of sample household. Most middle and rich peasant households look to their herds as an investment, a form of stored wealth, or as a saving to meet emergencies.

Beer brewing and selling is also considered very important in rich peasant households, especially those household headed by women. This is usually a weekly activity and the women who do this are considered wealthy. As we have seen in Case Study Number One, beer brewing need intensive labour. When beer is brewed, at least three women must actively work, boiling, cooking and mixing different ingredients. When the beer is sold a woman needs an other two or three women who would collect beer drinking container wash then so that they may be used by other people.



(iv) The Different Contributions of Male and Female Labour in Peasant Household.

Here it is important to consider the different contributions of male and female labour time schedule to the household formation. Table 4:11 presents the data on labour contribution by sex per week worked in a series of activities in the study areas. This was worked out from the questionnaire as to who contribute to what activity in peasant household. Questionnaires from different peasant strata were observed separately. It is found out that among rich and middle class peasantry subsistence production has been allocated to women, while cash crop or other money earning activities e.g charcoal burning among middle stratum or animal production among rich stratum is men's work. Family labour is subsistence production is undifferentiable by sex - being family activity in the poor peasant stratum.

What is immediately apparent is that when both men and women engage in money earning activities, men's remuneration is much higher than that of women. This reflects the parameters of the productive market. Within each activity there is a task specialization by sex - women sell the surplus of subsistence production e.g. dried vegetables groundnuts, millets etc. But when men engage in cultivation, they mostly specialize in cash crop production e.g. tomatoes, vegetables and grapes. Whereas the female activities represent an extension of work in the production of use value, men's



activities take on the form of cash - earning occupations and is apparently remunerated as such.

In this case, the most important cash earning activities in terms of labour time input in peasant households is animal production among rich peasant stratum, cash crop production or charcoal burning among middle stratum or wage labour among poor stratum.

Table 4:11 THE RELATIVE CONTRIBUTION OF FAMILY MEMBERS TOWARDS THE REPRODUCTION OF PEASANT HOUSEHOLDS. (SHOWING AVERAGE HOURS PER WEEK.)

(a) Data from Poor Peasant Households (N = 43)

Activity	Women	Men	Children
Household Maintenance	48 (50.5%)	14* (19.7%)	16 (66.7%)
Food Crop production	29 (50.5%)	29 (40.8%)	8 (33.3%)
Cash Crop production	-	-	-
Animal Care	-	-	-
Other money earning activity	.	-	-
Wage labour	18 (19.0%)	28 (39.5%)	-
Total	95 (100%)	71 (100%)	24 (100%)

* Refers to ^{five} single men who have to perform household maintenance because there is no one to work for them.



2

(b) Data from Middle Peasant Households (N = 59)

Activity	Women	Men	Children
Household Maintenance	48 (51.6%)	-	28 (43.75%)
Food Crop Production	39 (42 %)	6 (5.2%)	12 (18.75%)
Cash Crop Production	6 (6.4%)	39 (33.0%)	12 (18.75%)
Animal Care	-	35 (30.4%)	12 (18.75%)
Other money earning activities	-	35* (30.4%)	-
Wage labour	-	-	-
Total	93 (100%)	115 (100%)	64 (100%)

* Refers to 39 household heads who engage in charcoal burning as other means of money earning activity.

(c) Data from Rich Peasant Household . (N = 65)

Activity	Women	Men	Children
Household Maintenance	48 (35.3%)	-	28 (35.0%)
Food Crop Production	39 (28.7%)	-	22 (27.5%)
Cash Crop Production	-	-	-
Animal Care	14 (10.3%)	42 (100%)	30 (37.5%)
Other money earning activities	35* (25.7%)	-	-
Wage labour	-	-	-
Total	136 (100%)	42 (100%)	80 (100%)

* Refers mainly to 9 households headed by women who are beer brewers.



Table 4:11 (a) (b) and (c) shows the hours spent on different activities per week of household members. Almost all the married men in the sample do not participate in household maintenance. An attempt was made to examine the role of single men living alone and their contribution to their household maintenance. Only ^{five} men were interviewed regarding this issue. All of them said they do the household maintenance because there are no other persons to do the activity for them. For example women in different strata of the peasantry spend an average of 48 or an average of 7 hours per day on household maintenance that is cooking, cleaning, child care, water drawing and firewood collecting. Men who do the household maintenance spend only about 14 hours per week or two hours per day on activity like cooking firewood collecting cleaning and water drawing. The reason why men spend less time on household maintenance is related to the nature of work. Being a single man he does not have any child care to do. Second, cleaning, water drawing or firewood collection for one person is obviously not a daily activity.

My data could be compared with Ngalila (1977) who did a similar study in Buhongwe village, Mwanza District. Her study was based on observation of 10 households headed by male and another 10 household headed by women. On the whole some similarities as well as differences could be observed. Similarities could be observed in food crop production as well as cash crop production, though in



Ngalula study there is high participation of women in each crop production than in my study area. On the whole women could be observed to have a higher average of working hours than men.

Time dedicated to household maintenance is observed to differ, being 48 hours on average in my study area and 70 hours on average in Ngalula's study. Many reasons could be taken as an explanation, for one thing Ngalula's study was based on observation while my study is mainly based on information obtained through questionnaire. It is possible that time factor is greatly overlooked. These same reasons could also be taken for the differences in time dedicated to household maintenance by men, being 14 hours on average in my study area and 24 hours on average in Ngalula's study.

On other money earning activities such as charcoal burning or beer brewing etc. it is observed that time dedicated to these activities are slightly less in Ngalula studies, especially among women. It is possible that those activities that is charcoal burning or beer brewing is not labour intensive in Mwanza District than it is in Dodoma Districts. In actual fact there could be many factors. Another aspect of differences is that Ngalula study did not consider the contribution of children work.



For comparison purposes Ngalula's Data is summarized below to give a clear indication of what I have attempted to explain above.

Work Input by Ten Men and Ten Women In Different Activities of Peasant Households Production.
(Average hours per Week)

<u>Activity</u>	<u>Men</u>	<u>Women</u>
Household Maintenance	24	70
Subsistence Production	29	29
Cash crop production	35	30
Animal Care	not indicated	
Other money earning activities fishing		
Beer brewing charcoal burning etc.	32	16
Wage labour	Not indicated	
	120	146

Source: Ngalula 1977

Summary of tables 3:2 pp. 51; 3:3 pp. 57
and 3:6 pp. 60.



In conclusion, the importance of taking into account the form of integrating the peasant production to the wider economy (the state) as well as to the dominant capitalist economy is evident from the analysis. The interaction between family labour and the parameters of the product market are clear. In the first instance, the activities in which the peasant household may engage is mainly a function of their access to the means of production, especially land, and availability of labour. The second issue is the differential rewards to male and female labour in market participation. And thirdly the changing division of labour by sex in subsistence production among the majority or poor peasant household.



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS:

This study has demonstrated the manner in which water supply projects affect production and reproduction within peasant households, a structure which is mediated by social relations of production in the wider economy. The study has also looked into the role of water supply projects in domestic labour time schedules among rural women. Furthermore, the study investigated the role of water supply projects in health situations of the rural population. The main argument in this study is that clean water is important in improving people's health a fact which is in line with the obvious notion that a healthy population is necessary for transforming the rural economy which in turn would improve people's living standards materialwise. Water supply projects also relieve burdens of distant walks in search of water if one takes into account the obvious fact of women carrying water on their heads. Through this study however, it has been established that the provision of piped water alone is not enough. The kind of water supplied to the people must be of acceptable quality. For example, though Kigwe has a good water supply system, people do not use the water because it is salty. As a result they still depend on their traditional water sources, disregarding the expensive and modern government instituted project completely.

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C. K. K.



Coupled with the fact that the traditional water sources are polluted, and even without pollution in many cases they are unsafe on many healthy grounds, people are still forced to go long distances in search of water, which in this case is a lot ^{less} salty, particularly during the dry season. The situation therefore remains the same; neither people's health is improved nor the burden of water drawing relieved.

Do peasants need improved water supply in order to increase production, though? This study has shown how important water is in production and reproduction. Moreover, it has also been indicated that what the peasant household is in great need of, at the moment is labour resource. This has been shown by the fact that within the poor stratum of the peasantry the subsistence level is hardly reached because of labour constraints, while on the other hand in the rich peasant stratum, surplus is realized through using family and/or hired labour. In the middle stratum of the peasantry, since their grown up children remain at home after their primary school education, it was observed that family labour is used in different activities which contribute towards realizing a higher subsistence level.

But having water for more people could mean
a higher level of production!



As the above information indicates, what is more relevant to improvement of peasant production is modernization of their tools and methods of production. Until now, the peasants in the two study areas have been found to be 100% dependent on simple hoes for production of both subsistence and cash crops. Their methods of cultivation are no better either. In depth, research to involve participation of the peasants in deciding what type of tools and methods of production are the best for their situation is necessary. Of course no body will deny that water is important in peasant production as well as in other basic services such as primary health facilities, education, agricultural extention, veterinary services which are very important in peasant production and reproduction. There has never been studies of this kind in Dodoma Rural District of Dodoma Region and I should therefore think more research is necessary in the relation between water supply and peasant production and reproduction. Research of this kind should be conducted in different locations and during different seasons of the year in order to get a clear understanding of this important aspect of rural development.



Methodologically, it is found useful to approach the peasant question using different peasant strata as I have indicated in my study case. The main argument for using a variety of peasant strata with different economic and social positions as well as with different historical experiences, is that water supply projects do not necessarily address the issues situated in social relations of production. Norms and attitudes also play a great role in peasant production, especially as far as division of labour in respect to sex is concerned. The strata selected in this study thus represent a differential pattern with respect to pressure on land, crop pattern and historically based division of labour.

Because of important economic and historical differences among regions or districts for that matter, the study perspective was limited to the types of relationships found within this particular area.

For the study of division of labour and contribution to production from other members of the household, different methodologies are possible. The only method leading to a strict quantitative information on family members' work schedule however, is a strict time-budget survey, studying the husband's wife's and children's work schedule during



different seasons, or having their tasks registered through a long period of time. This method is time consuming. The time budget survey methodology has been used for husband's and wife's tasks in peasant households in Embu district (Kenya), by Jane Wills (1967) and Bukoba district (Tanzania), by Jorgen Rald (1975). This methodology has some limitations, though. First it limits the possibilities to study more households in more than one area and secondly it becomes insurmountable if used for all members of the household.

Another method which has been used in some studies implies that each household fill out registration forms of tasks in cultivation and household maintenance by each member of the household. This method is very useful though one should institute check up control mechanisms in a survey even of a single crop. The method was used by Moody (1970) in Bukoba district (Tanzania).

My intention was to use the first methodology since it is more feasible in a study aiming at showing the role of water supply projects in peasant production and reproduction. But because of the time factor allocated for this study, I was forced to do something less. Therefore the study aimed at getting the information of the usual tasks done by each member of the household, checked by controls, open ended questionnaires and observation.



The data collected made it possible to make a qualitative analysis. A quantitative analysis was impossible due to the non availability of previous studies as well as lack of time as stated above. Generally the problem of analysis seemed to be studying a dynamic change with water supply projects on the one hand and peasant production and reproduction on the other, at one point at a time. This is an important and far reaching methodological problem. In this study many aspects of the traditional division of labour have been analysed. Changes from the traditional division of labour imply social change. Proof of any change cannot be provided, but analysis of a variety of information and their patterns in different strata of the peasantry will contribute to the analysis of social transformation.

RECOMMENDATIONS FOR WATER SUPPLY POLICY IN DODOMA
RURAL DISTRICT.

It has been observed that people do not use the improved water supply in Kigwe on the grounds that water is salty. It is my opinion that had the villagers have been involved from the stage of planning up to the final stage, such short-comings could have been noticed and solutions found then and there. But as things turned out to be, the project had been completed and a lot of money spent without people benefiting from the project.



In future, I should suggest that water project planners, implementers alike should involve the people for whom the projects are planned and meant for, so that they participate in decision making as to how best the project should operate. I should also suggest that since salty water seems to be the problem more than anything else in the district, water engineers should carry out more and relevant feasibility studies on the salty aspect of water so that large sums of money are not spent on projects which do not benefit the people. In areas where no other alternatives are possible, salty water should be desalinated. Furthermore, in planning water supply projects, not only domestic water supply should be brought into consideration, but also the important fact that water for livestock drinking and consumption should be included. During the rainy season however, rain water could be harnessed for agricultural purposes and in particular it should be used to develop and improve pasture for livestock. To alleviate the long journies made by women to draw water, I should also suggest that the domestic water points should be evenly distributed all over the villages and should be 400 meters from each household and when and where possible ~~the~~ distance should be reduced.



Finally, it is likely that increased knowledge of the relationship between water supply and peasant production and reproduction will help in the fuller understanding of the analysis of social transformation. If this study encourages or stimulates further research in this field, it will have served its purpose.

Impact of radio HE ?



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APENDEX A

Umuhimu wa Miradi wa Maif Safi kwa Watu Vijijini
hasa katika shughuli za Kilimo na Uchumi.

Jina la Kijiji

Taraha

Nambari ya Kaya:

Jina la Mwenye Kaya:

Anayejibu maswali:

Mume

Mke

1. Taarifa kuhusu Kaya

1. Aina gani ya Watu wako katika kaya hii?

Na	Uhusiano kwa Mkuu wa Kaya	Umri	Mke/ Mume	Amesoma mpaka darasa la ngapi	Kwao hasa ni Wapi hapa hapa kijijini au nje ya kijiji - Taja wapi
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.



2. Je, unacho cho chochote hapa kijijini?

Ndio

Hapana

Kama jibu ni Ndiyo, ni cho gani kati ya vyeo vifuatavyo?

a. Mjumbe wa Halmashauri ya Kijiji.

b. Mjumbe wa Kamati ya Kijiji

c. Mjumbe wa Nyumba kuni kuni

d. Mwenyekiti wa kijiji

e. Katibu wa kijiji

f. Mtumishi wa serikali kuu

3. Unavyo vitu vifuatavyo nyumbani kwako:

a) Baiskeli Ndiyo..... Hapana

b) Radio Ndiyo Hapana

4. Ulizaliwa hapa kijijini: Ndiyo Hapana

5. Kama jibu ni hapana. Ulizaliwa wapi? na ulishi wapi

kwingine kabla ya kuhamia katika kijiji hiki:

.....

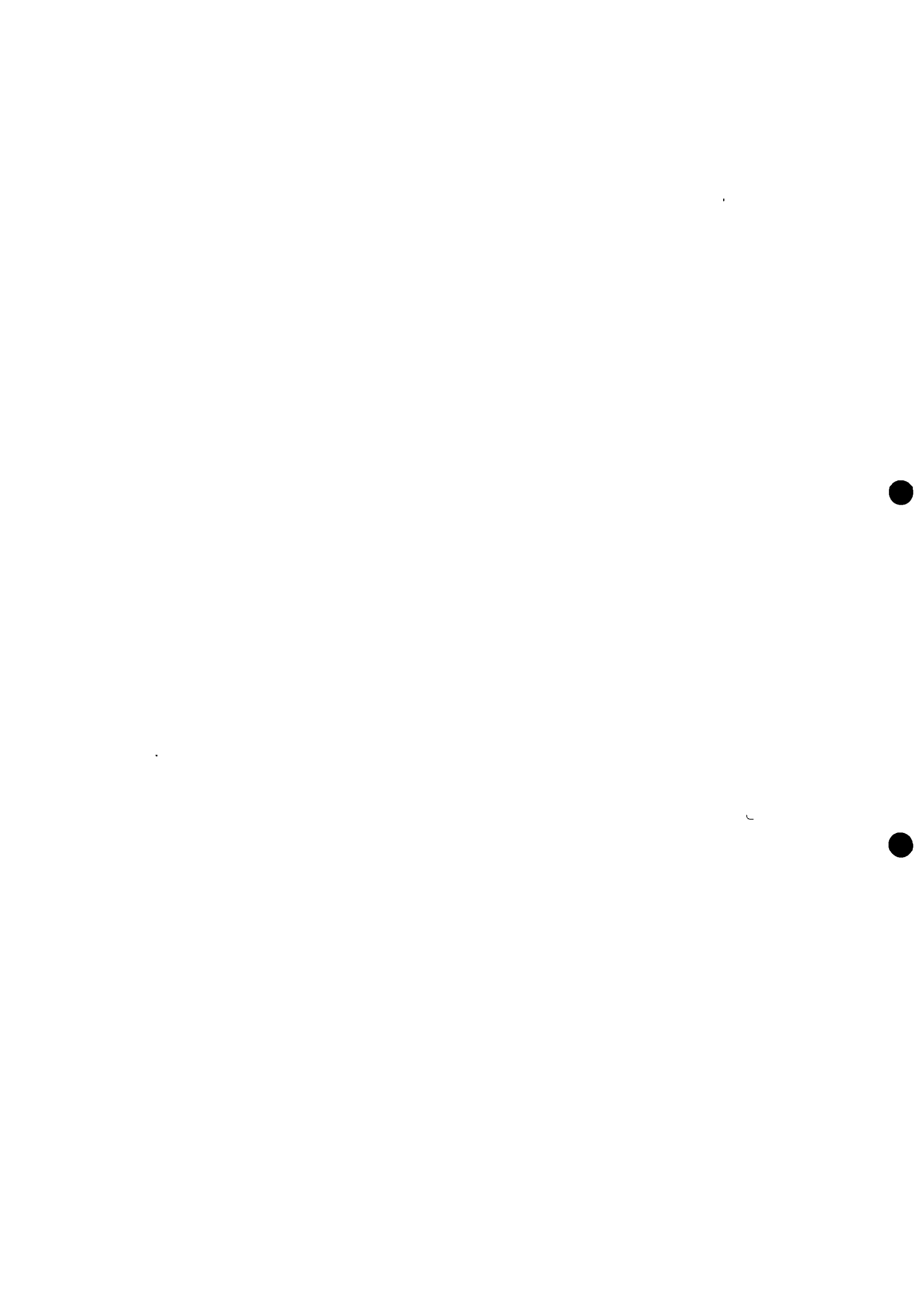
.....

6. Sehemu hii ijazwe na wanawake wenye umri uli zidi miaka 18

Umri wa mwanamke anayejibu swali

Umpata kuzaa watoto wangapi mpaka sasa

Ni watoto wangapi kati ya hao bado wako hai



II. Taarifa kuhusu Maji

7. Maji yanayotumika nyumbani hutekwa mara ngapi kwa mathumuni yafuatayo

Mathumuni	Mahali yanapochotwa	Mara ngapi kwa siku	Mara ngapi kwa wiki	Hani huwa anayeleta
Kunywa				
Kupika				
Kusafisha vyombo				
Kuoga/Kunawa				
Kufua nguo				

8. Maji huchotwa kutoka wapi kati ya sehemu zifuatazo?

Schemu ya Maji	Mtu anaye-chota	Nyakati za mvua (Masika)		Nyakati za Kiangazi	
		Masika	Umbali KM	Kiangazi	Umbali
Bomba					
Kisima cha Kisasa					
Kisima cha kiasili					
Dimbwe					
Chemchem					
Mto					
Maji ya mvua					
Nyinginezo (taja)					



9. Kwa nini unaendelea kuteka maji kutoka sehemu unayoteka kila mara?

- a) Ii sehemu pekee yenye maji
- b) Ii karibu zaidi
- c) Maji ni masafi zaidi
- d) Sababu nyinginezo

Taja:

10. Kati ya matatizo yafuatayo lipi unafikiri ni tatizo kubwa kuliko yote ambalo linawakabili kufuatana na sehemu yapatikanapo maji katika msimu mbali mbali?

Matatizo	Sehemu ya Kiasilia za Maji		Sehemu a kisasa za Maji	
	Masika	Kiangazi	Masika	Kiangazi
Uhaba
Uchafu
Umbali
Msururu mirefu
Kutokuaminika kupatikana
Mengine (Taja)

11. Kama maji unayoyatumia sasa siyo masafi, ni kwa sababu gani?

- a)
- b)
- c)



12. Kama kijiji kina bomba au kisima cha kisasa, kwa nini huwa wakati mwingine hamvitumii

- a) Uharibifu wa bomba au kisima wa mara kwa mara.....
 - b) Uharibifu wa bomba au kisima wa muda mrefu
 - c) Umbali wa mahali bomba na kisima vilipo
 - d) Mizururu mirefu wakati wa kuteka maji
 - e) Maji ni machafu
 - f) Mengine .l.....
- Taja
-

13. Nani anahusika na utokaji maji katika familia

- a) Baba
- Mama
- Watoto
- b) Kame ni watoto: umri
- Wasichana/Wavulana

14. Kiasi gani cha maji hutekwa kwa ajili ya matumizi kwa siku katika msimu mbali mbali wa mwaka

Nyumbani	Watekaji	KM Umbali	Idadi ya Safari	Kiasi kwa safari moja	Kiasi kwa siku
Msimu	Mama				
	Baba				
	Watoto				
Kiargazi	Mama				
	Baba				
	Watoto				



15. Kwa kawaida maji hutekwa wakati gani?

Athunuru	Saa	10.00	11.00	12.00		
Asubuhi	Saa	1.00	2.00	3.00	4.00	5.00
Mchana	Saa	6.00	7.00	8.00	9.00	
Jioni	Saa	10.00	11.00	12.00	1.00	2.00

16. Maji kuhifadhiwa namna gani hapa numbwani hasa maji ya kunywa?

- a) Aina ya chombo
 - i) Debe
 - ii) Ndoo
 - iii) Mtungi
 - iv) Kibuyu
 - v) Pipa
 - vi) Vinginevyo

Tagaji

17. (a) Chombo hicho husafishwa?

Ndiyo

Hapana

(b) Mara ngapi wa wiki?

Mara moja

Mara mbili

Mara nyingi



18. Maji ya kunywa huchemshwa?

Ndiyo

Hapana

(b) Kama jibu ni hapana nieleze ni kwa sababu gani?

.....

19. Je, ulipata kushiriki katika mradi wa kukipatia maji
kijiji

Ndiyo

Hapana

20. Kama ulishiriki katika mrasi wa kukipatia maji kijiji,
ulishiriki vipi au mchango wako ulikuwa wa namna gani?

a) Nilichanga fedha

b) Nilijitolea kufanya kazi bila malipo

c) Nilifanya kazi na kulipwa

21. Kama kijiji hakina bomba au kisima cha kisasa ni faida
gani unafikiri ungepata kama kijiji kingepatiwa maji
mengi, ya bomba au maji ya kisima cha kisasa:

a)

b)

c)

22. Kama kijiji hakina bomba au kisima cha kisasa, je ni aina
gani ya maji ungependa kijiji kipewe?

a) Maji ya bomba

b) Maji ya kisima cha kisasa



23. Kama maji ya bomba, au ya kisima cha kisasa yangekuwa
ya kulipia ungekuwa tayari kulipia:

Ndiyo

Hapana

III. Taarifa kuhusu Mapato

24. Katika Mazao ya Chakula ulipata magunia mangapi
mzimu uliopita yaani msimu wa 79/80

Mahindi Mtama..... Karanga.....

Mengineo

25. Je chakula hicho kilitosheleza mahitaji ya jamii yako?

Ndiyo

Hapana

26. Kama Ndiyo kuna chakula chochote ulichokuza?

Ndiyo

Hapana

Kama ndiyo, eleza ni kitu gani ulichouza na ulipata

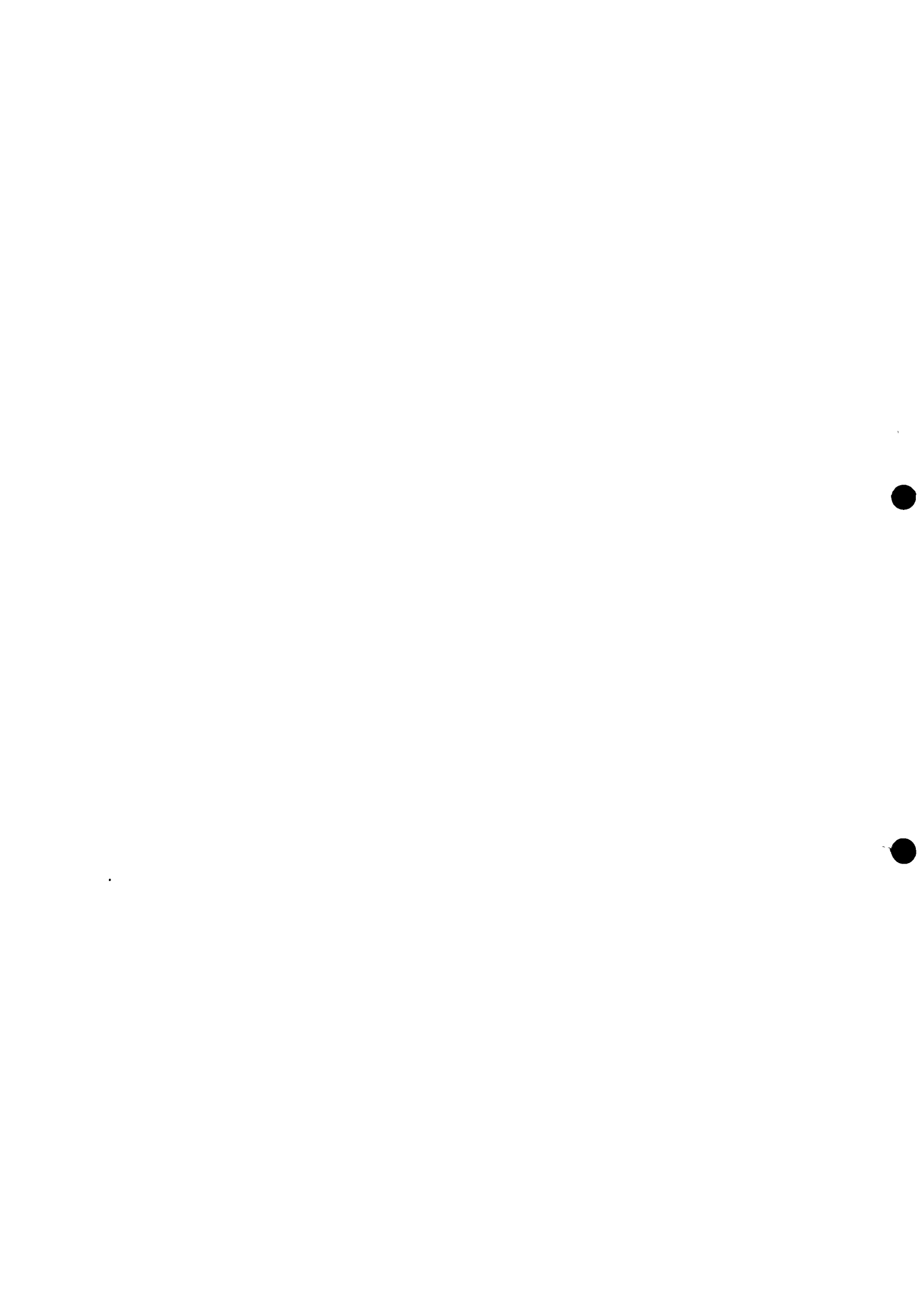
fedha kiasi gani

.....

.....

27. Kama hapana. Je ulitumia kiasi gani ya fedha kwa kununulia
chakula cha ziada

.....



28. Fedha ulizotumia kwa kununulia chakula ulizipata
kwa njia gani?
.....

29. Je unahifadhi mazao yako namna gani?
Ghala nje ya nyumba
Ghala ndani ya nyumba
Katika chombo chochote
Ndani ya nyumba
Mengineo

30 Tafadhali unieleze shughuli zote ulizofanya jana,
tangu ulipoamka asubuhi hadi ulipo lala usiku. Ni
wakati gani uliotumia kwa kila shughuli na kama
ulishirikiana na mtu yeyote katika kaya yako

Shughuli	Wakati uliotumia	Umeshirikia na nani



IV. Taarifa Kuhusu Afya

31. Je, kuna mmoja katika haya yenu ambaye amepata kuugua maraahi au moja ya magonjwa yafuatayo?

- a) malaria
- b) kichocho
- c) Kipindupindu
- d) Ugonjwa wa tumbo
- e) Ugonjwa wa macho
- f) Ugonjwa wa ngozi

32. Swali hili ni kwa akina mama wenye watoto wenye umri wa miaka 5 na kushuka chini. Pia akina mama waja wazito

Je huwa una hudhuria Kiliniki ya MCH

Ndiyo

Hapana

33. Kama jibu ni Ndiyo, nionyeshe cheti au vyeti vya mahudhurio

a) Mtoto 1 Umri Uzito

Mtoto 2

Mtoto 3

Mtoto 4

Mtoto 5

b) Mama mja mzito anaweza kuonyesha kadi yake ndogo inayoonyesha siku za kuhudhuria katika tarehe zinazotajwa.



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10

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4
5

100



v. Taarifa Kuhusu shughuli za Uchumi

Ipi ni njia kubwa ya mapato kifedha kwa kikaya kati ya njia zifuatazo na ni nani anayehusika na shughuli hiyo na nani anayeamua matumizi ya fedha inayopatikana kwa njia hiyo.

Njia inayoleta fedha	Anayehusika na shughuli hiyo	Anayetoa uamuzi namna fedha kutokana na shughuli hiyo inavyotumika
Mauzo ya mazao ya chakula		
Mauzo ya mazao ya biashara		
Kufanya biashara		
Kufanya kazi mbali mbali kijijini		
Mauzo ya pombe za kienyeji		
Mauzo ya mboga za majani		
Mauzo ya kazi za mikono		
Mauzo ya mifugo		
Mengineo		
Taja:
.....

