# HEALTH STATUS
# IN RESETTLED AND INDIGENOUS POPULATION
# (KETO SETTLEMENT)
# IN KELEM AWRAJA, WOLLEGA REGION, SOUTHWESTERN ETHIOPIA

BY

ADANE MEKONNEN, M.D.

Thesis submitted as partial Fulfillment of the Requirements for the Degree of Masters of Public Health

Addis Ababa, Ethiopia, 1988

ADDIS ABABA UNIVERSITY
School of Graduate Studies

# Health Status In Resettled And Indigenous Population (Keto Settlement) In Kelem Awraja, Wollega Region, Southwestern Ethiopia

by

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## SUMMARY

This study is a cross sectional sample survey on the health status of 10 villages (5 resettlement and 5 indigenous) in Kelem Awraja, Wollega Region, Southwestern Ethiopia. The field study was conducted in September and October 1987. The survey consisted of a set of questionnaires on socio- demographic, health status, nutritional assessment of under-five children and stool examination for ova and parasites. The socio-demographic data revealed that the total population covered by the study was 3779 people, out of which 2040 were settlers (54%) and 1739 were indigenous (46%). The literacy rate between the two groups showed no difference 32.6% and 33.4%, but much lower when compared to the national figure which is 60%. The major sources of water supply for more than 50% were from unprotected springs and river water for both groups. The availability of latrines and garbage disposal pits for settlers was more than 90%. For the indigenous group about 50% had latrines and less than 30% had a garbage disposal pit. In health facilities and health care, again the settlers were in a better position compared to the indigenous. Immunization coverage, antenatal attendance and delivery services were significantly higher in the settlers. As far as morbidity was concerned , 25.2% and 19.7% of the settlers and indigenous respectively reported sick during the last

two weeks. Nutritional status in under-five children was poor but showed no difference between the two groups. With regards to prevalence of intestinal parasites in the two groups, 69.4% of the settlers were found positive whereas in the indigenous 77.1% were positive. Explanations were offered for the better health services and health status of the settlers.

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## ABBRIVATIONS

| | |
|---|---|
| WHO - | World Health Organization |
| KAP - | Knowledge attitude practice |
| M - | Male |
| F - | Female |
| % - | Percent |
| No - | Number |
| Health Inst. - | Health Institution |
| TBA - | Traditional Birth Attendant |
| Kg. - | Kilogram |
| Cm. - | Centimeter |
| Km. - | Kilometer |
| & - | and |
| Ht. - | Height |
| Wt. - | Weight |
| NGO - | Non government organization |
| Private ref. disp. - | Private refuse disposal |
| Common ref. disp. - | Common refuse disposal |
| Vaccin. - | Vaccinated |
| Inc. trained - | Including trained |
| RRC - | Relief and Rehabilitation Commission |
| REWA - | Revolutionary Ethiopia Women Association |

deteriorate into famine conditions leading to starvation, epidemic diseases and mass movement of people and animals in search of food, water and employment (1, 2, 3).

### 1.1.1. Drought

On a global scale droughts are quite common. The pattern varies considerably from year to year, a year with few droughts may be followed by one with many (4). Drought and other factors like war are the major factors to generate refugees and displaced persons. In 1971 over nine million inhabitants of East Pakistan, now Bangladesh, fled to India. During 1973, 1974 and again in 1975 famine displaced thousands of people in Ethiopia. From Angola, in 1978 about 100,000 people suddenly arrived in the Shaba province of Zaire. That same year 200,000 refugees from Burma streamed into Bangladesh. Then early in 1979 large numbers of refugees and displaced persons in Somalia gave cause for concern, as did the Indochinese "boat people" stranded in camps and small islands stretching from Thailand to the Philippines. In 1980 some 300,000 starving, exhausted Khmer people fled Kampuchea into Thailand and severe drought again threatened hundreds of thousands of lives in East and Horn of Africa (3). Thus a temporary camp for displaced persons may become a permanent settlement with its own land and assistance given for the development of farming and small scale industries, such as happened in Tanzania for refugees from Burundi. Some

communities may be enormous comprising 60,000 people and more; others grow less rapidly with little organization. There may be a constant movement as people are resettled and new displaced persons arrive. As people are resettled in one area, the chief cause of death mainly for the drought affected ones is malnutrition especially to the younger age group. However, aside from malnutrition, other factors like crowding and poor sanitation have an impact in hastening the rapid spread of infectious diseases which have a more serious effect on malnourished persons (3,5). Thus such conditions demand provision of basic human needs such as water, adequate food, proper health care and other related activities.

### 1.1.2. Drought in Ethiopia

Drought in the failure of either the Belg or Meher rains or both has been a common phenomenon in the history of Ethiopia for several hundred years (8). In the country four famines have occurred, ie, the famine of 1888,the Tigray famine of 1958, The Wag-Lasta Famine of 1966 and the Welo Famine of 1973. As the result of these famines the country lost a great number of human as well as cattle life. The first famine happened as the result of the loss of oxen, because of disease, which brought about the collapse of the whole production system. In addition the government and the people were helpless to tackle this disastrous situation. The reasons for the most recent droughts,making the country vulnerable to famine, are said

to be : 1. small and often fragmented land; 2. primitive tools and implements; 3. production geared to personal needs rather than to market, 4. lack of alternative or seasonal employment and 5. almost total absence of reserves of either grain or cash (9).

The factors associated with drought and famine are apparently many and complex. One approach to its explanation is by considering the process of under-development. There is a wide consensus that only poor societies, poor social groups and poor households suffer famine and hunger. Social inequalities, poverty, high illiteracy rate and lack of conscious understanding of the physical and biological environment will lead to the destruction of an ecological balance necessary for the mere survival of man.

Thus viewing drought as a 'natural'event has very little support. This is because the so called natural causes are themselves in part often the results of actions or omissions by man. Thus drought is mainly due to "man-made" causes. Within this general back-ground, some of the interrelated causes of drought under Ethiopian Conditions could be: bad agricultural practice, low levels of technology, land tenure systems, high population growth, deforestation, inadequate development programmes, and micro and macro climatic changes.

### 1.1.3. Settlement In Ethiopia

#### 1.1.3.1. Spontaneous Settlement

Much earlier resettlement involved short distance migration. With a build up of population pressures and a decline in land fertility in traditional farming areas, the only escape appears to have been resettlement. In later years many resettlements involved long distance migration and were associated with the resettlement of outsiders or nonlocal population groups. It is not unusual to observe, however, the simultaneous settlement of short distance and long distance migrants in the same general area. For example, in 1977 both long and short distance migrants were found in southwest Ethiopia. Long distance migrants tended to come from and resettle in rural areas; they are young, often single and literate; they often chose to migrate because of rising aspirations, and general dissatisfaction with their home area. In contrast, short distance migrants were characterized as relatively older, married with families; mainly illiterates motivated to resettle in response to environmental problems such as erosion, irregularity of rain fall, predations of wild animals and problems of associated with the systems of tenancy and land taxation (10).

Spontaneous settlement has played a crucial part in the historical development of the Ethiopian national state. The northward migrations of Pastoralists who settled in the

highlands in the past and the southward expansion of the central state represent key processes in the genesis of Ethiopian social formations. The more recent movement down from the crowded central highlands increased dramatically this century. With the consolidation and extension of the central administration following conquests at the end of the last century, opportunities for settlement were spurred by the ancient regimes policy awarding land grants in lieu of military pensions. Additional push factors in the north including population increases, land degradation and fragmentation, contributed to the flow of spontaneous resettlement (11).

1.1.3.2. Organized Settlement - The 1960's

Settlement Schemes

Organized settlement has a much more recent origin and only became a nationally significant issue since the revolution. The former regime considered resettlement primarily in terms of agricultural development. The first 5 year development plan (1957-61) only mentions settlement as a passing remark. The concept gained currency with the establishment of the Ministry of Land Reform and Administration in 1966.

Resettling a few thousand families to stimulate commercial agricultural development was envisaged in a policy oriented study of land settlement in 1966. The policy objectives were spelled out in the third 5 year plan

(1968-73). Agricultural production would be stimulated and population pressure in the northern plateau relieved by making use of underdeveloped land. By 1969 there were only four settlement schemes with less than 700 families. The first scheme was started by the governor of Sidamo in 1958.

Six hundred settlers moved from the crowded highlands to the lowlands in that region. In 1970 the scheme turned into the Wollamo Agricultural Development Unit (WADU) under the Ministry of Agriculture (11).

#### 1.1.2.3 The 1970's And 1980's Settlement Schemes

A dramatic increase of settlement occurred in the 1970's prompted largely by the early 70's drought and the former regime's neglect of the issue. By 1975 there were 57 settlement schemes with some 20,000 settlers. This five fold increase was made possible largely by the Land Reform Proclamation of February 1975, which nationalized all rural lands (11).

The 1980's settlement began as the result of the second devastating famine to strike Ethiopia within a decade. The poor rains in 1983 drastically reduced harvest throughout the vast areas of the north and was followed in 1984 by the failure of the Belg rains. The slow onset of these rains was first noted in the March 1984 RRC Assistance Requirements Report. An Early Warning System Report, produced in May, noted that unlike previous years the 1984 Belg rain failure has affected all regions of the

country. It disrupted the Belg season's agricultural activities and delayed agricultural activities for the Meher season. The total failure of the Belg rains made an already bad situation worse. An RRC report of August 1984 estimated that the number of people facing food shortages had risen from just over five million to over six million . The coup de grace was delivered by the sporadic performance of the Meher rains which started late, fell lightly if at all and in all parts of the country were over by the end of August 1984, a month earlier than usual. Numbers of people affected by food shortages rose from the six million mark, through the seven million mark to 7.9 million at the end of the year. It had been recognized by the government for some time, however, that drought and its debilitating effects would become endemic to the country unless the following activities were undertaken : more relief and development assistance and much larger allocations of domestic resources to victims of the drought . Greater international assistance was also needed to complement these efforts. Due to the large number of people affected by drought famine, the endemic food shortages and unproductiveland, the government put into action in late 1984 a plan to settle 3000,000 families over a period of one year (13). In November 1984 the government declared its intention to move 1.5 million people from the country's food shortage areas to Kefa, Wollega, Illubabor and Gojam. The decision was stimulated by the 1984/85 famine. Government officials justified the resettlement plan on humanitarian and

economic grounds. They argued that the north was no longer capable of supporting its present population and that the underutilized and supposedly fertile lands of the south needed to be placed under the plow in order to accelerate the contribution of agriculture to the nations economic development (11,12).

In less than 2 years, more than half a million people have been resettled from the north to the southwestern part of the country. Three factors account for this dramatic increase in organized resettlement. The Land Reform Act of 1975 paved the way, the early 1980's famine created the necessary conditions and the establishment of the Workers Party of Ethiopia in 1984 provided the requisite willpower, manpower and organizational capacity to execute this formidable task (11).

1.1.3.4. Settlement in Wollega Region

Wollega has the largest resettled population with over 250,000 people or 41.7% of the total resettlement program. It is also the only region with all three types of resettlement : conventional complexes of linked villages of 500 families (60%), integrated sites within existing peasant associations (36%) and settlers integrated within previous resettlement sites (4%). The recent settlers represent about 10% of the Regions' two and a quarter million inhabitants (11).

Settlement areas are chosen in the lowlands (Kola) which is below 1500 meters above the sea level. This altitude is favorable for the presence of different types of diseases. Most of the developing countries lie within the tropics; the semi-tropical environment not only provides better environmental conditions for urban development, but also provides better conditions for the multiplication of vectors, such as malarious mosquitos (16).

In particular, when people move from highlands to lowlands for settlement, malaria is severe and spreads fast due to the virtual absence of immunity in the highland population (17). Among the 20 leading causes of morbidity in the region, malaria ranks fourth (18). The malaria office in the Awraja identified Anfilo Woreda and Keto settlement sites as the most malarious areas in the Awraja. the commonest causes of morbidity are P. falciparum and P. vivax (19). Although malaria is clearly an important health problem in the resettlement sites, for reasons of cost and time it was not included in the present study.

The source of income in most developing countries is based on agriculture and agricultural development schemes are closely linked with the establishment of new settlements where people are brought to live in a defined area. More often than not in this new setting, people acquire parasites and other diseases that they have not

experienced in their former environment and in such cases the consequences may be very dramatic (14,16).

Some of the important indicators of general ill health are the presence of infectious diseases. This problem is important in developing countries where the social and economic conditions require 1) better food, 2) better clothing, 3) better shelter, 4) provision of wells, latrines, sewage and other waste disposal facilities together with other means of controlling disease. Since settlers in this area are from different climatic and environmental situations, high priority must be accorded to their health. Settlers are usually exposed to infection due to low resistance as the result of famine (malnutrition). Health not only results from genuine socioeconomic development, but it is also an essential investment of a country for socioeconomic development. It is difficult to achieve substantial economic development when one out of five children dies before completing one year of life, when a higher proportion of children suffer from stunted growth due to malnutrition, when life expectancy can be shortened by as much as a tenth by disease, or when a person is faced by disability and disease at what is potentially the most productive age (7,).

The purpose of this study is to assess and compare the health status of the resettled and the indigenous population in Keto resettlement villages and around it in

Kelem Awraja, Wollega Region. Health status is a complex phenomenon to measure. A study in Gondar used different health measures to assess health status (21). And the measures used to assess health status in this study are illustrated in the methodology (page 25,26).

It is useful to conduct such studies in the early periods of settlement, because it will elucidate what type of diseases settlers are likely to introduce to the new area and what type of diseases are prevalent in the area that the settlers may acquire. Actually due to the urgency of the problem, it was not possible to do the study in the early periods of the resettlement. However, since they have been resettled in this area for only three years, it is not too late to conduct such studies and examine differences.

In Ethiopia, 600,000 people are resettled in new settlement areas to put an end to future recurrence of famine. A lot of effort is put into improving the general socioeconomic status of famine stricken population, but parallel to these activities it is of great importance to conduct epidemiological studies in human settlement complexes to avoid errors in meeting the actual health needs of the resettled population.

### 1.1.2.5. Objectives Of The Study

#### 1.1.2.5.1. General Objective

To study differences and similarities of health status in resettled and indigenous population in order to identify health problems and institute reliable preventive measures.

1.1.2.5.2. Specific objectives

1.1.2.5.2.1. To collect basic information on the socio-demographic situation.

1.1.2.5.2.2. To know the environmental sanitation and water supply condition in the area.

1.1.2.5.2.3. To determine the nutritional status in under-five years children.

1.1.2.5.2.4. To determine the rate of intestinal parasitic infection.

1.1.2.6. Significance of the Study

When reliable information is collected as baseline it will be very important for decision makers to institute appropriate intervention programmes in the study area. Furthermore, the data will be useful for further epidemiological research and for coordinating the Primary Health Care activities of health institutions in the resettlement villages. If such programmes become successful, this will be very valuable information to national decision makers and the outcome of this study will be used as a guide for further studies in the resettlement and rural areas in the country.

Fifure 1.

MAP OF ETHIOPIA

# CHAPTER II LITERATURE REVIEW

## 2.1. Situation of Displaced People in the World

A review of the literature reveals many articles related to displaced persons. United Nations report in 1984 (1) explained the forms of disaster which could occur in the human environment. S.Simmonds et al in 1983 (2) wrote about the situation of refugees and displaced people in the world as the result of different types of disaster. In her book, she wrote the situation of displaced people in the former East Pakistan, now Bangladesh, Ethiopia, Angola, Thailand and Kampuchea. Displacement of people is not limited to Ethiopia, it occurs elsewhere in the world. The same author in 1987 (3) wrote about both acute and long term disasters in developing countries and in Particular Ethiopia. She gave emphasis on the 1984/85 drought which affected many people in the country. At the same time Glantz in 1987 (4) wrote about the condition in Sub-Saharan Africa. Starving children, emaciated animals, crowded refugee camps and dry wateringholes were seen on television and in photographs. These distrubing scenes represent the toll of recurrent drought,which over the past 20 years has made the region a focus of global attention and generated large outpourings of humanitarian concern and assistance. He further explained about the increases in atmospheric carbondioxide and other radio active trace of gases resulting from human activities and the modification of land surfaces. This " greenhouse" effect in

all likelihood is resulting in droughts on the African Continent. In Courier Graykowski in 1987 (5) wrote about the importance of reaforestation, protecting forestory resources-fire wood saving schemes, antierosion, rational use of resources and developing new and renewable energy. Simalarly the Pan American Health Organization in 1982 (6) suggested that areas proposed for accomodating displaced persons must be surveyed inorder to determine whether basic environmental health services can be provided and whether use of the sites might upset the environmental health services of the area or of surrounding areas. Specific environmental concerns to be addressed to displaced people include: Water Supply, Environmental Sanitation, Housing (shelter), vector control, food sanitation-nutrition and personal hygiene. Timothy in 1985 (7) also explained about the assessment of nutrition and health needs in drought affected African Nations. He further wrote; in drought affected areas, early rapid assessment of the nutritional status and the health needs of the population is critical to estimating the degree of current and impending problems and to instituting timely and appropriate interventions.

## 2.2. Drought in Ethiopia

Berhane in 1988 (8) and Mesfin in 1987 (9) wrote about the history of drought and famine. Taking records of famir

over a twenty year period in the 102 provinces of Ethiopia, Mesfin analyses the roots and consequences of famine in the country.

Eshetu and Teshome in 1987 (10) and Pankrest and Ezykiel in 1986 (11) wrote about the history of settlement schemes in Ethiopia. Pankrest in his work explained about the settlements in Wollega Region. Also the report of WHO technical team in 1984 (12) and the Relief and Rehabilitation Commission in 1985 (13) stressed on the climatic and crop conditions that have been steadily deteriorating over the past 10 years and the failure of rain in the 1983-84 season which proved catastrophic for the northern regions. The obvious outcome of this has been recurring shortfalls in food production and food availability bringing hunger and to 1.5 million.This paved the way for resettlement.

Bearer et al in 1984 (14), WHO report in 1987 (15) and Shibru. in 1986 (16) discussed the agricultural development schemes and their linkage to the establishment of new settlements where people are brought to live in a defined area. More often than not in the new home people acquire parasites and other diseases that they have not experienced in their old homes and in such cases the consequence may be very dramatic. This problem is more relevant to developing countries where the social and economic condition require a great deal of improvement in

terms of better food, better shelter, better clothing,provision of wells, latrines, sewages and other wast disposal facilities together with other means of controlling diseases.

Shibru in 1986 (16) and Nigussie et al in 1988 (17) stressed that settlement areas are located in the lowlands (Kola) which is below 1500 metres above sea level and this altitude is favorable for the presence of malaria. In its annual report, the Wollega Regional Health Department in 1987/88, (18) among the 20 leading causes of morbidity in the region malaria was found to be fourth. And Adane in 1987 (19) identified Anfilo Woreda (district) and Keto settlements site as the most malarious areas in the Awraja (province).

## Health Status and Social Factors

Bergner in 1987 (20) discussed about the need for an operational definition of health before the health level or health status of an individual or population can be assessed. And he further grouped health status measures in to four categories: 1. examination of the health of general populations; examinations of clinical interventions and their effects, 3. examinations of changes in the health care delivery system, and 4. examination of health promotion activities and their effects. In this study to measure health status different studies were examined. These references included Mekonnen et al in 1986 (21) wrote

about health status survey among peasant families from 8 villages organized in Agricultural Producers' Cooperatives in Gondar Administrative Region, northwestern Ethiopia. The study consisted of a household health survey questionaire plus other parameters to measure health status. Other papers like the Ethiopia Population and Housing Census Commission in 1984 (22) and the National Literacy Campaign Coordinating Committee in 1986 (23) identified population ratio, average household size and the Literacy status of the country. A study in Sudan in 1987 (24) showed higher susceptibility to disease in new comers compared to the local inhabitatants. Also a report of WHO in 1982 (25) wrote that about 80% of the population in rural parts of Africa have no reasonable access to safe water supply. Similarly in his book Gebre-Emanual in 1977 (26) discussed the importance of water and its relationship to environmental health. Other authors like Misra in 1975 (27), Azurine et al in 1974 (28)and Isely in 1985 (29) give more emphasis in promoting good hygiene practices through health education. And Gebre-Emanuel in 1984 (30) wrote about the importance of excreta disposal in public health, common excreta borne diseases and their importance in public health. Regarding immunization, Zein et al in 1979 (31) found that the success of the campaign was the result of the cooperation of the Urban Dwellers Association in mobilizing the community. A Similar study by Addis Ababa City Council and United Nations Childrens' Fund in 1987 (32) carried out a base-line survey in Addis

Ababa. Indicators classified as direct and related were identified and grouped under four main groups: 1 health policy indicators; 2. social and economic indicators; 3. indicators of provision of health care and 4. health status indicators. This was done in order to obtain the right kind of information for planning and managing PHC.

Choudhurry et al in 1987 (33) found in a survey conducted in Bangladesh that 99% of women who had ever been married claimed that they had heard at least one efficient method of contraception, whereas only 11% of married women were using such a method. A similar study in by Zein et al in 1987 (34) showed that majority of the women (65%) were aware of the existence of modern contraceptive, methods while 17% were current users.

Other papers like Dialogue on Diarrhoea in 1988 (35) suggested breast milk is the best and safest food for young babies. It will enable them to acquire good growth and stay healthy. In their study Waterlow et al in 1977 (36) used height and weight data for comparing the nutritional status of children under the age of 10 years. And for interpretation of these data, the WHO standard in 1983 (37) was used. Also WHO in 1981 (38) compiled health indicators.

The provisional Military Government of Socialist Ethiopia office of National Committee for Central Planning

Central Statistics Office in 1986 (39) reported the health conditions of the population, treatment practices and availability of sanitary facilities and practices of the rural population. And Feachem et al in 1984 (40) wrote that a breast milk fed children were protected from diarrhoea compared to those not breast fed. The same author in 1984 (41) suggested that promotion of personal and domestic hygiene is an effective intervention for the contorl of diarrhoeal disease among young children. The Provisional Military Government of Socialist Ethiopia ministry of Health in 1986 (42) explained health determinants in the comprehensive health directory 1983/84.

As far as prevalence of intestinal parasites is concerned studies in different parts of the country were conducted. In the study conducted by Kloos et al in 1981 (43) in Awash Valley, Gebreselassie in 1982 (44) in Gondar Region, Zein et al in 1986 (45) in Gondar Region, Farmers Cooperatives, Hailegnaw in 1987 (46) different localities of Gambella Awraja, Kloos et al in 1988 (47) in schistosomiasis survey in the country and McConnell et al in 1976 (48) in fifty communities in Ethiopia observed high prevalence rates in the areas where they conducted their studies.

# CHAPTER III METHODOLOGY

## 3.1. General

The 1984/85 drought has seriously affected the lives of millions of people in Ethiopia. To alleviate the drought problems and to provide permanent solution, the Workers Party of Ethiopia has taken measures giving priority to strengthening the already existing relief and rehabilitation programs. The immediate aim of the relief assistance was to save those who were at risk and later provide opportunities for those who want to resettle from the drought prone regions to productive fertile areas so as to make them self-reliant and productive (12). The Keto Resettlement complex is one of the largest rehabilitation programs organized by the government, founded in 1985 by the directive of the Workers Party of Ethiopia.

## 3.2. Study Design

This study is a cross-sectional descriptive survey carried out on settlers who lived in Keto since 1985 and indigenous population in the vicinity of the resettlement area. As with most such surveys the following short comings could be observed such as interview bias, and excluding those who died and who left.

Prior to the start of the study the higher officials of the Government and health personnel of the Region as well as the Awraja were informed about the objectives of the study, its relevance, use and benefit for future planning and interventions. The Training and Demonstration Center for Awraja Health Managers at the former Ras Imiru Compound approached-the Wollega Regional Health Department which facilitated and fully cooperated from the start up to the end. Kelem Awraja Party and Administrative officials and health institution heads in Dembidollo and Keto were also informed. In the resettlement villages and indigenous peasant associations, concerned government officials, health workers, and mass organization leaders were officially approached.

### 3.3 Study Population

The study households were selected from the Keto Resettlement area. The 5 resettlement villages were selected randomly from the 20 resettlement villages, which makes 25% of the total. The five included indigenous villages were located close to the 5 resettlement villages. The settlement villages selected for the study were numbers : 3,8,9,13,19. The indigenous villages included in the study were: Mechara, Wacho, Chanka Bururi, Dogano Adami and Awetu farmer associations. The distance from village 3 to Chanka Bururi is 2.8 km, from village 8 to Machara is 11 km, from village 9 to Wacha is 3 kms, from village 13 to

Dogano Adami is 8 km and from village 19 to Awetu is 2 kms(see figure 2, page 30). A complete enumeration of the houses in the 10 selected villages was undertaken. The total numbers of households available for the study in these 10 villages were 3831, ie,1857 were Wollo Settlers (48.5%), 430 were Shewa settlers (11.2%) and 1544 were indigenous (40.3%). Using a stratified random sampling technique, 1000 households were selected for the study, ie, 485 from Wollo settlers (48.5%), 112 from Shewa Settlers (11.2%) and 403 from the indigenous (40.3%) (See Appendix 7.B.2, pp97). Eventhough these groups live in different sites, they meet together in Chanka town for marketing and Keto health center for medical care.

The field study started on September 15/1987 and lasted 2 months. The laboratory work and compiling was done in the study area.

## 3.4. Variables

Health status assessment measure could be addressed using several variables. In this due to time and cost, the study was limited on the following variables:

Socio Demographic

- Age
- Sex
- Family size
- Literacy status
- Religion
- Climatic condition

Housing, water supply and environmental sanitation

- Type of housing
- Source of water supply
- Personal hygiene practices
- Excreta and refuse disposal methods used.

Health Status

- Immunization status of under 2 years & pregnant women
- Antenatal care
- Births during the year
- Marital status
- Family planning
- Child spacing practice

- Breast feeding
- Supplementary food to infants
- Nutritional status in under 5 years children
- Morbidity and mortality rates of all ages groups and sex
- prevalence of intestinal parasites.

## 3.5. Methods of Data Collection

### 3.5.1. Questionnaire

Fourteen interviewers (four were health workers) with an educational background of grade 12 and above were trained in the administration of the questionnaires. The questionnaire was translated into Amharic and Oromugna. It had a closed question form which could be easily filled out by the interviewer. The interviewers spoke both Amharic and Oromugna without any difficulty.

Prior to data collection, the interviewers were well oriented on the objective of the study how they should approach the population; and the importance of filling the forms properly.

A pre-test was done on 30 subjects 2 per interviewer and 2 by the investigator before the final questionnaire was used in the study villages.

Before the actual commencement of the survey, the community was informed by government officials and community leaders on the purpose of the study. This was to harness the cooperation of the community in providing the necessary information to the questions asked and in submission of stool specimen according to the guide given.

The interview was done at a time convenient to the respondent when most of the household members were at home. The active participation of the community leaders in organizing the study population to come to the study area has helped a lot to facilitate the work.

### 3.5.2. Stool Specimen Collection

Once a household was selected for the study, at least three members of the household were asked to provide stool for examination, ie, the head of the household, his wife and one of the under-five children who was able to give a stool specimen for examination.

All the subjects were registered by his/her respective house number, name, age, sex and questionnaire number. A plastic sheet and a small plastic container was dispensed for specimen collection with appropriate instructions for each subject.

### 3.5. 3. Laboratory Work

The collected specimens were examined the same day. Laboratory examination was done using the direct method. The specimen was examined by the investigator assisted by a junior laboratory technician and his aid. Each slide was examined twice by the same person but not by another. Laboratory examination was done in the field using iodine for stool and normal saline (0.9%) for the preparation of the direct method. Limitations in the laboratory work could be: 1. lack of reliability in specimen collection and examination, and 2 inability to use concentration method for stool examination.

### 3.5.4. Anthropometric Measurement

The anthropometric measurements included height and weight of the under-5-year children in the selected households. All measurements were taken by the investigator, health assistants and one nutrition worker who received training prior to the study.

Subjects were weighed without excess clothing or shoes. The type of weight scale balance used for the study was SECA donated by UNICEF. The weight scale balance was checked before the start of any measurement. It was placed on a level ground. Heights were measured using the meter stick fixed on the balance scale. For very young children unable to stand, recumbent length was measured with the child lying on a flat board with the head against a stationary surface perpendicular to the board.

Age of the child was taken as given by the mother. Key events such as like holiday were considered for the calculation of the age. Lack of specific date of birth was a major limitation.

The method used for classification of nutritional status was the Waterlow classification (36). The reason for selection of this method was because it gives the general nutritional picture of a community by using height, weight and age. Using this method one can understand whether a child has chronic malnutrition, acute malnutrition or both. The cut-off points taken were > (-2SD) and < (-2SD) from the median both for weight for height and height for age.

# CHAPTER IV RESULTS

## 4.1. Coverage of the Study Population

From a total of 1000 households selected for the study, five households from the Wollo settlers and two households from the indigenous were missing because of absenteeism and illnesses. Therefore, from the 485 selected households from the Wollo settlers 480 (98.9%) participated in the study. All the selected households from the Shoa settlers participated in the study. The selected households from the indigenous (Wollega) were 403, but 401 (99.5%) participated in the study. The total number of households both from the indigenous and the settlers who participated in the study were 993 (99.3%).

## 4.2. Socio-Demographic Characteristics

### 4.2.1. Demography

The total population covered by the study was 3779 people (Table 1) out of which 2040 (54%) were settlers and 1739 (46%) were from the indigenous population. The overall male to female sex ratio was 101.8/100, and the male to female sex ratio of settlers and the indigenous population was 105.9/100 and 97.2/100 respectively. The total burden of dependency ratio was 54.8/100 and for the settlers was 51.7/100 while that of the indigenous was 58.3/100.

Table 1. Distribution of the Study Population by Age and Sex and by Place of Origin

| AGE | SETTLERS | | | | | | | | INDIGENOUS | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WOLLO | | | | SHOA | | | | WOLLEGA | | | | | |
| | M | | F | | M | | F | | M | | F | | M + F | |
| | No | % | No | % | No | % | No | % | No | % | No | % | No | % |
| 2 | 132 | 16.4 | 139 | 19.4 | 43 | 17.7 | 58 | 21.3 | 101 | 11.8 | 103 | 11.7 | 576 | 15.2 |
| 2 - 4 | 123 | 15.3 | 98 | 13.6 | 10 | 4.2 | 26 | 9.5 | 131 | 15.5 | 118 | 13.4 | 506 | 13.4 |
| 5 - 14 | 136 | 16.9 | 120 | 16.7 | 81 | 33.3 | 89 | 32.6 | 279 | 32.6 | 283 | 32.1 | 988 | 2.1 |
| 15 - 44 | 249 | 30.9 | 217 | 30.2 | 65 | 26.7 | 83 | 30.4 | 207 | 24.1 | 253 | 28.6 | 1074 | 28.4 |
| 45 - 64 | 143 | 17.7 | 124 | 17.2 | 28 | 11.5 | 15 | 5.5 | 96 | 11.2 | 80 | 9.1 | 486 | 12.9 |
| 65 + | 23 | 2.8 | 21 | 2.9 | 16 | 6.6 | 1 | 0.7 | 43 | 5.0 | 45 | 5.1 | 149 | 4.0 |
| Total | 806 | 100.0 | 719 | 100.0 | 243 | 100.0 | 272 | 100.0 | [illegible] | 100.0 | 882 | 100.0 | 3779 | 100.0 |

### 4.2.2. Family size

The average family size for the settlers was 3.4 and that of the indigenous was 4.3 (Table 2). This difference was statistically significant P < 0.05).

**Table 2. Distribution of Family Size by Place of Origin**

| Number of Persons | Settlers | | | Indigenous | | |
|---|---|---|---|---|---|---|
| | No. of Households | Total Population | % | No. of Households | Total Population | % |
| 2 - 3 | 53 | 183 | 9.0 | 30 | 130 | 7.5 |
| 4 - 5 | 417 | 1436 | 70.4 | 184 | 797 | 45.8 |
| 6 - 7 | 102 | 352 | 17.2 | 147 | 638 | 36.7 |
| > 8 | 20 | 69 | 3.4 | 40 | 174 | 10.0 |
| Total | 592 | 2040 | 100.0 | 401 | 1739 | 100.0 |

$X = 78, df(3), P < 0.05.$

### 4.2.3. Literacy Status

The literacy status was similar in both groups (P > 0.05, Table 3).

**Table 3. Literacy Status of the Head of Households by Place of Origin**

| Origin | Read and Write | | Do Not Read & Write | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Settlers | 193 | 32.6 | 399 | 67.4 | 592 | 100.0 |
| Indigenous | 134 | 33.4 | 267 | 66.6 | 401 | 100.0 |
| Total | 327 | 32.9 | 666 | 67.1 | 993 | 100.0 |

$X = 0.07$, df(1), $P > 0.05$.

### 4.2.4. Religion

With regards to religion of the head of households, there was a difference between the two groups, the majority of the settlers were muslim whereas the indigenous were christian ($P < 0.001$, Table 4).

**Table 4. Distribution of Religion of Head of Households by Place of Origin.**

| Origin | Christian | | Muslim | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Settlers | 234 | 39.5 | 358 | 60.5 | 592 | 100.0 |
| Indigenous | 311 | 77.6 | 90 | 22.4 | 401 | 100.0 |
| Total | 545 | 54.9 | 448 | 45.1 | 993 | 100.0 |

$X = 140$, $df(1)$, $P < 0.001$.

### 4.2.5. Climatic Condition

Only 30.7% of the settlers were from lowland (Kola) climate while all the indigenous were from lowland (Table 5).

**Table 5. Climatic Condition of Household Heads by Place of Origin**

| Origin | Highland | | Temperate | | Lowland | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 96 | 16.2 | 314 | 53.1 | 182 | 30.7 | 592 | 100.0 |
| Indiginous | - | - | - | - | 401 | 100.0 | 401 | 100.0 |
| Total | 96 | 9.7 | 314 | 31.6 | 583 | 58.7 | 993 | 100.0 |

## 4.3. Housing, Water Supply and Sanitation

### 4.3.1. Housing Condition.

All Houses belonging to the settlers were thatched roof and constructed with wood while 94.5 % of the houses belinging to the indigenous were thatched roof and constructed with wood. Only 35.5 % of the houses of the settlers were plastered with mud as compared to 42.1 % of the houses of the indigenous ( $P < 0.05$, Table 6).

Table 6. Type of housing Used by Place of Origin.

| Origin | Corrugated Iron Roof Constructed by Wood | | | | Thatched Roof Constructed by Wood | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Plastered with mud | | Not Plastered with mud | | Plastered with mud | | Not Plastered with mud | | | |
| | No. | % | No. | % | No. | % | No | % | No | % |
| Settlers | - | - | - | - | 210 | 35.5 | 382 | 64.5 | 592 | 100.0 |
| Indigenous | 22 | 5.5 | - | - | 169 | 42.1 | 210 | 52.4 | 401 | 100.0 |
| Total | 22 | 2.2 | - | - | 379 | 38.2 | 592 | 59.6 | 993 | 100.0 |

$X^2 = 7.5$, df(1.), $P < 0.05$.

4.3.2. Water Supply

The major sources of water supply in the study area were springs and rivers. And there was no difference in water supply between the settlers and the indigenous ( $P \leq 0.05$, Table 7)

Table 7. Source of water Supply to Households by Place of Origin.

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| Origin | Safe Water | | | | Unsafe Water | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Protected Well | | Protected Spring | | Unprotected Well | | Unprotected Spring | | River | | | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 21 | 3.6 | 270 | 45.6 | - | - | 160 | 27.0 | 141 | 23.8 | 592 | 100.0 |
| Indigenous | 12 | 3.0 | 174 | 43.4 | - | - | 101 | 25.2 | 114 | 28.4 | 401 | 100.0 |
| Total | 33 | 3.3 | 444 | 44.7 | - | - | 261 | 26.3 | 255 | 25.7 | 993 | 100.0 |

$X^2$ ( Safe water versus unsafe water) = 0.83; df(1); $P \leq 0.05$.

### 4.3.3. Distance Travelled to Fetch Water

When both groups were compared with regards to distance travelled to fetch water, more than 67.6% of settlers travelled more than one km. (Table 8).

In this case there was a difference between the two groups concerning distance travelled to fetch water ($P < 0.05$).

**Table 8. Distance Travelled to Fetch Water by Place of Origin**

| Origin | Distance | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | < 1 km. | | 1-1.5 km. | | > 1.5 km. | | | |
| | No. | % | No. | % | No. | % | No. | % |
| Settler | 192 | 32.4 | 205 | 34.6 | 195 | 33.0 | 592 | 100.0 |
| Indigenous | 208 | 51.9 | 103 | 25.7 | 90 | 22.4 | 401 | 100.0 |
| Total | 400 | 40.3 | 308 | 31.0 | 285 | 28.7 | 993 | 100.0 |

$X = 37$, df(2), $P < 0.05$

### 4.3.4. Personal Hygiene Practices

In personal hygiene practices, ie, washing the body and clothes, there was a significant difference between the two groups ($P < 0.05$, Table 9 and 10), the indigenous having better hygienic practices

**Table 9. Frequency of Washing the Body by Place of Origin**

| Origin | Once in a Week | | Once in 2 Weeks | | Once in more than 2 Weeks | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 74 | 12.5 | 505 | 83.3 | 13 | 2.2 | 592 | 100.0 |
| Indigenous | 82 | 20.4 | 312 | 77.8 | 7 | 1.8 | 401 | 100.0 |
| Total | 156 | 15.7 | 817 | 82.3 | 20 | 2.0 | 993 | 100.0 |

$X = 12$, $df(2)$, $P < 0.05$.

Table 10. Frequency of Washing Clothes by Place of Origin

| Origin | Once in a Week | | Once in 2 Weeks | | Once in more than 2 Weeks | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 143 | 24.2 | 407 | 68.7 | 42 | 7.1 | 592 | 100.0 |
| Indigenous | 137 | 34.2 | 223 | 55.6 | 41 | 10.2 | 401 | 100.0 |
| Total | 280 | 28.2 | 630 | 63.4 | 83 | 8.4 | 993 | 100.0 |

$X = 18$, $df(2)$, $P < 0.05$.

## 4.4. Environmental Sanitation.

### 4.4.1. Excreta and Refuse Disposal Methods Used

Only 4.4% of the settlers were without latrine, as compared to the 50% of the indigenous population without latrine ($P < 0.001$, Table 11). With regards to availability of refuse disposal pits, only 8.6% of settlers were without refuse disposal pit as compared to the 79.3% of the indigenous without refuse disposal pit ($P < 0.001$, Table 12).

**Table 11. Excreta Disposal Methods Used by Head of Households By Place of Origin**

| Origin | Private Latrine | | Common Latrine | | No Latrine | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 80 | 13.5 | 486 | 82.1 | 26 | 4.4 | 592 | 100.0 |
| Indigenous | 70 | 17.5 | 130 | 32.5 | 201 | 50.0 | 401 | 100.0 |
| Total | 150 | 15.1 | 616 | 62.0 | 227 | 22.9 | 993 | 100.0 |

$X = 315$, $df(2)$, $P < 0.001$.

Table 12. Refuse Disposal Method Used by Place of Origin

| Origin | Private Ref. Disposal Pit | | Common Ref. Disposal Pit | | No Ref. Disosal Pit | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 96 | 16.2 | 445 | 75.2 | 51 | 8.6 | 592 | 100.0 |
| Indigenous | 33 | 8.2 | 50 | 12.5 | 318 | 79.3 | 401 | 100.0 |
| Total | 129 | 13.0 | 495 | 49.8 | 369 | 37.2 | 993 | 100.0 |

$X = 510.8$, df(1), $P < 0.001$

## 4.5. Health Status

### 4.5.1. Immunization

The proportion of fully immunized children in the settlers (66.2%) was double that of the indigenous (33.8%). And the defaulter rate was higher in children of the indigenous (21.6%) compared to that of the settlers (5.6%), ($P < 0.001$, Table 13).

**Table 13. Immunization Status in Children of Under two Years by Place of Origin**

| Origin | Vaccinated | | | | | | Not Vaccina. | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Started | | Defaulters | | Completed | | | | | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 97 | 26.9 | 21 | 5.6 | 249 | 66.2 | 5 | 1.3 | 372 | 100.0 |
| Indigenous | 80 | 39.2 | 44 | 21.6 | 69 | 33.8 | 11 | 5.4 | 204 | 100.0 |
| Total | 177 | 30.7 | 65 | 11.3 | 318 | 55.2 | 16 | 2.8 | 576 | 100.0 |

X (Settlers fully immunized versus indigenous fully immunized = 59.4, df(1), $P < 0.001$.

Women who had not vaccination during the last pregnancy among the settlers were 11.2% and that of the indigenous 58.4%, a remarkable difference ($P < 0.001$, Table 14).

**Table 14. Vaccination During the Last Pregnancy by Place of Origin**

| Origin | Yes | | No | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Settlers | 337 | 88.8 | 43 | 11.2 | 380 | 100.0 |
| Indigenous | 104 | 41.6 | 146 | 58.4 | 250 | 100.0 |
| Total | 441 | 69.4 | 189 | 30.6 | 630 | 100.0 |

$X = 201$, $df(1)$, $P < 0.001$

### 4.5.2. Antenatal Care Service, Place of Delivery of the Last Child, Person who assisted during the Last Delivery and Births during the year.

Antenatal care attendance by the settlers was 88.8% whereas it was only 41.6% by the indigenous ($P < 0.001$, Table 15).

Settlers were using health institutions for delivery three times as much as the indigenous (21.9% versus 7.8%, P < 0.001, Table 16).

Deliveries attended by health personnel among the settlers were 37.3% and that of the indigenous were 16.6% (P < 0.001, Table 17).

Crude birth rate in the study population was 50.9/1000 for settlers and 48.3/1000 for the indigenous. There was no difference in crude birth rate between the two groups (P > 0.05, Table 18).

Table 15. Attendance of Antenatal Care By Place of Origin

| Origin | Yes | | No | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Settlers | 337 | 88.8 | 43 | 11.2 | 380 | 100.0 |
| Indigenous | 104 | 41.6 | 146 | 58.4 | 250 | 100.0 |
| Total | 441 | 69.4 | 189 | 30.6 | 630 | 100.0 |

X = 201, df(1), P < 0.001.

Table 16. Place of Delivery of the Last Child by Place of Origin

| Origin | Health Inst. | | Home | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Settlers | 83 | 21.9 | 297 | 78.1 | 380 | 100.0 |
| Indigenous | 20 | 7.8 | 230 | 92.2 | 250 | 100.0 |
| Total | 103 | 16.1 | 527 | 83.9 | 630 | 100.0 |

$X = 27$, df(1), $P < 0.001$.

Table 17. Person who Assisted During Delivery of the Last Child by Place of Origin

| Origin | Health Prson. Inc. Trained TBA | | TBA Untrained | | Family Member | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 142 | 37.3 | 138 | 36.4 | 100 | 26.3 | 380 | 100.0 |
| Indigenous | 41 | 16.6 | 153 | 61.1 | 56 | 22.3 | 250 | 100.0 |
| Total | 183 | 28.7 | 291 | 46.6 | 156 | 24.7 | 630 | 100.0 |

$X = 54.8$, df(2), $P < 0.001$.

Table 18. Infants Born During the Year (October 86- September 87) By Place of Origin

| | Crude Birth Rate | | |
|---|---|---|---|
| Origin | Number | /1000 | Total Population |
| Settlers | 104 | 50.9 | 2040 |
| Indigenous | 84 | 48.3 | 1739 |
| Total | 188 | 49.7 | 3779 |

$X = 0.137$, df(1), $P > 0.05$.

### 4.5.3. Marriage and Family Planning

There was a considerable difference in the opinion about the age at which women should get married among the two groups, the indigenous felt that women should marry later (P < 0.001, Table 19).

Table 19. Age at Which Female Should get Married by Place of Origin.

| Origin | < 10 Years | | 10-15 Years | | 16-17 Years | | > 18 Years | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 12 | 2.0 | 373 | 63.0 | 179 | 30.2 | 28 | 4.8 | 592 | 100.0 |
| Indigenous | - | - | - | - | 252 | 62.8 | 149 | 37.2 | 401 | 100.0 |
| Total | 12 | 1.2 | 373 | 37.6 | 431 | 43.4 | 177 | 17.8 | 993 | 100.0 |

X (for < 18 or > 18) = 171, 1, df(1), P < 0.001.

27.8% of the settlers had child spacing practice of less than 2 years and below as compared to 36.2% of the indigenous. There was a difference in child spacing between the two groups ($P < 0.05$, Table 20).

**Table 20. Child Spacing Practice by Place Or Origin**

| Origin | 1 Year | | 2 Years | | 3 Years | | 4 Years | | 5 Years | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 7 | 1.9 | 99 | 25.9 | 164 | 43.2 | 50 | 13.2 | 60 | 15.8 | 380 | 100.0 |
| Indigenous | 11 | 4.2 | 80 | 32.0 | 110 | 44.0 | 26 | 10.5 | 23 | 9.3 | 250 | 100.0 |
| Total | 18 | 2.9 | 179 | 28.4 | 274 | 43.5 | 76 | 12.1 | 83 | 13.1 | 630 | 100.0 |

$X = 13.68$, $df(4)$, $P < 0.05$.

When knowledge and utilization of family planning service was compared between the two groups, there was a significant difference ($P < 0.05$, Table 21).

**Table 21. Knowledge and Utilization of Family Planning by Place of Origin**

| Origin | Know & Use | | Know & Do not Use | | Do not Know | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 20 | 5.3 | 132 | 34.7 | 228 | 60.0 | 380 | 100.0 |
| Indigenous | 10 | 3.9 | 69 | 27.7 | 171 | 68.4 | 250 | 100.0 |
| Total | 30 | 4.7 | 201 | 31.9 | 399 | 63.4 | 630 | 100.0 |

$X = 6.2$, $df(2)$, $P < 0.05$.

### 4.5.4. Infant Feeding Practices.

Prolonged duration of breastfeeding was practiced by the two groups of mothers. However the settlers breastfed considerably longer ($P < 0.001$, Table 22).

**Table 22. Duration of Breastfeeding by Place of Origin.**

| Origin | < 1 Year | | 1 Year | | 2 Years | | 3 Years | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 5 | 1.3 | 23 | 6.1 | 115 | 30.3 | 237 | 62.3 | 380 | 100.0 |
| Indigenous | 3 | 1.2 | 27 | 10.8 | 185 | 73.8 | 35 | 14.2 | 250 | 100.0 |
| Total | 8 | 1.2 | 50 | 8.1 | 300 | 48.2 | 272 | 42.5 | 630 | 100.0 |

$X = 188$, df(3), $P < 0.001$.

The age of starting supplementary foods to children was similar in both groups (P > 0.05, Table 23).

Table 23. Age of Children Starting Supplementary Food by Place of Origin

| Origin | 2-5 Months | | 6-8 Months | | 9-12 Months | | >12 Months | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 127 | 33.5 | 211 | 55.4 | 42 | 11.1 | - | - | 380 | 100.0 |
| Indigenous | 73 | 29.2 | 153 | 61.2 | 24 | 9.6 | - | - | 250 | 100.0 |
| Total | 200 | 31.8 | 364 | 57.7 | 66 | 10.5 | - | - | 630 | 100.0 |

$X = 2.5$, $df(2)$, $P > 0.05$.

Although milk was given in roughly the same proportions (settlers 26.5%, indigenous 22.3%), the type of milk was very different. Most mothers in the settlers group gave powdered milk obtained from relief aid, whereas the indigenous gave cow's milk. There was an overall difference in the type of supplementary food given to children in the two groups (P < 0.001, Table 24).

**Table 24. Type of Supplementary Foods Given to Children By Place of Origin**

| Origin | Milk Only | | Injera/ Bread & Miilk | | Injera/ Bread Only | | Porridge | | Abish | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NO. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 101 | 26.5 | 119 | 31.4 | 146 | 38.3 | 18 | 3.8 | - | - | 380 | 100.0 |
| Indigenous | 56 | 22,3 | 33 | 13.3 | 130 | 51.8 | 14 | 5.7 | 17 | 6.9 | 250 | 100.0 |
| Total | 157 | 24.8 | 152 | 23.8 | 276 | 43.7 | 28 | 4.9 | 17 | 2.8 | 630 | 100.0 |

X = 37.2, df(3), P < 0.001.

### 4.5.5. Morbidity and Mortality Rates

The head of households were questioned about any type of illness experienced by any family members in two weeks preceeding the interview. There was more illness reported by the settlers ($P < 0.001$, Table 25).

**Table 25. Reported sickness in the Family in the Previous two Weeks**

Place of Origin

| Origin | Sick | | Total Population | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Settlers | 514 | 25.2 | 2040 | 100.0 |
| Indigenous | 342 | 19.7 | 1739 | 100.0 |
| Total | 856 | 22.5 | 3779 | 100.0 |

$X = 16.41$, $df(1)$, $P < 0.001$.

A total of 630 mothers from both groups were asked about diarrhoea episodes in under-five children during the last two weeks prior to the study, ie, 380 mothers from the settlers and 250 mothers from the indigenous population. There was no difference in diarrhoea episodes in the two groups (P > 0.05, Table 26).

**Table 26. Diarrhoea Episodes in Under-five Children by Place of Origin per family**

| Origin | Diarrhoea Episodes | | | | | | | | No Diarrhoea | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | 2 | | 3 | | 4 | | | | | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Settlers | 84 | 22.1 | 119 | 31.2 | 27 | 7.2 | - | - | 150 | 39.5 | 380 | 100.0 |
| Indigenous | 91 | 36.4 | 43 | 17.2 | 24 | 9.7 | - | - | 92 | 36.7 | 250 | 100.0 |
| Total | 175 | 28 | 162 | 25.4 | 51 | 8.2 | - | - | 242 | 38.4 | 630 | 100.0 |

X =(Any diarrhoea versus no diarrhoea) = 0.66, df(1), P > 0.05.

The heads of households were questioned about deaths in their household during the preceeding one year. The crude death rates were essentially similar in both groups; settlers 21.1%; indigenous 19.5% ($P > 0.05$, Table 27).

**Table 27. Deaths During the Year (October 86-September 87)**

**Place of Origin**

| Origin | Deaths | | Total Population |
|---|---|---|---|
| | NO. | Rate/1000 | |
| Settlers | 43 | 21.1 | 2040 |
| Indigenous | 34 | 19.5 | 1739 |
| Total | 77 | 20.4 | 3779 |

$X = 0.049$, $df(1)$, $P > 0.05$.

## 4.6. Nutritional Status

A nutrition survey was conducted in the 910 under-five children, 460 from the settlers (50.5%) and 450 from the indigenous (49.5%) (Table 28).

**Table 28, Classification of Nutritional Status of Under-five 5 children by WaterLow Categories by Place of Origin**

SETTLERS (460)

| HEIGHT FOR WEIGHT | HEIGHT FOR AGE | |
|---|---|---|
| Z - Score | > (-2SD)[1] | < (-2SD) |
| > (-2SD) | 135[2] (29.4%)[3] Normal | 185 (40.1%) Stunted |
| < (-2SD) | 121 (26.3%) Wasted | 19 (4.2%) Stunted and Wasted |

INDIGENOUS (450)

| HEIGHT FOR WEIGHT | HEIGHT FOR AGE | |
|---|---|---|
| Z - Score | > (-2SD)[1] | < (-2SD) |
| > (-2SD) | 116[2] (25.7%)[3] Normal | 183 (40.6%) Stunted |
| < (-2SD) | 119 (26.5%) Wasted | 32 (7.2%) Stunted and Wasted |



1 = Standard deviation

2 = Number

3 = Percentage

Since it was difficult to get the exact age, then (Wt/Ht < (-2SD) was determined on both groups of under-five children to assess the nutritional status. There was no difference in the two groups (P > 0.05, Table 29).

Table 29. Classification of Nutritional Status of Under-Five Children (Wt/Ht) by Place of Origin

| Origin | < (-2SD) | > (-2SD) | Total |
|---|---|---|---|
| Settlers | 140 | 320 | 460 |
| Indigenous | 151 | 299 | 450 |
| Total | 291 | 619 | 910 |

$X = 1.14$, df(1), $P > 0.05$.

### 4.7. Prevalence Rate of Intestinal Parasites

From the total study population which is 3779, 2901 subjects submitted (76.7%) a stool specimen for examination. Males were 1488 (51.3%) and females 1413 (48.7%). The total positives for one or more intestinal parasites were 2101 giving the overall prevalence rate of 72.4%.

Out of the 1767 settlers who submitted stool specimens, 1227 (69.4%) were found to be positive for one or more parasites (Table 32). Out of the 1134 indigenous, 874 (77.1%) were found to be positive for one or more parasites (Table 33). There was a statistically significant difference ($P < 0.001$) showing a higher prevalence among the indigenous population (Table 31).

The prevalence rate of intestinal parasites was also computed by age. There was a highly statistically significant difference in adults as compared to children in both groups (Table 32 and 33, $P < 0.001$.)

Similarly, when the prevalence rate of intestinal parasites was computed by sex for both groups, there was a statistically significant difference, males being higher in both groups ($P < 0.05$, Tables 32 and 33). Of those positives for intestinal parasitic infections, 70.2% of settlers were positive for only one type of parasite, and the rest were with multiple infections. Among the indigenous 71.1% were positive for only one type of parasite (Table 30).

Eight parasites accounted for all the infections in the two groups. The highest infection rate was recorded for hookworm among settlers (37.2%) and indigenous (38%) and the least frequent cause of infection among settlers (1.0%) and indigenous (0.5%) was hymenolepis spp (Figure 3,page 65). Among the important parasites which give public concern, schistosomiasis was not found in the two groups.

**Table 30. Distribution of Parasitic Infection by Place of Origin**

| Origin | Positive | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | With one Parasite | | With two Parasite | | With three Parasite | | | |
| | No. | % | No. | % | No. | % | No. | % |
| Settlers | 858 | 70.0 | 313 | 25.5 | 56 | 4.5 | 1227 | 100.0 |
| Indigenous | 621 | 71.1 | 239 | 27.3 | 14 | 1.6 | 874 | 100.0 |
| Total | 1479 | 70.3 | 552 | 26.4 | 70 | 3.3 | 2101 | 100.0 |

Table 31. Parasitic Infection Prevalence Rate by Place of Origin

| Origin | Positive | Negative | Total |
|---|---|---|---|
| Settler | 1227 | 540 | 1767 |
| Indigenous | 874 | 260 | 1134 |
| Total | 2101 | 800 | 2901 |

X (Settlers Versus Indigenous) = 20.4, df(1), P < 0.001.

Table 32. Intestinal Parasitic Infection Point Prevalence Rate by Age and Sex among Settlers, 1987.

| Age In Years | Number Exam. | | Total | Positive | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | M + F | Male | | Female | | | |
| | No. | No. | No. | No. | % | No. | % | No. | % |
| 1 | 7 | 7 | 14 | 2 | 28.5 | 1 | 14.2 | 3 | 21.4 |
| 1-4 | 95 | 93 | 188 | 49 | 51.6 | 57 | 61.3 | 106 | 56.4 |
| 5-9 | 83 | 71 | 154 | 54 | 65.0 | 34 | 47.8 | 88 | 57.1 |
| 10-14 | 80 | 96 | 176 | 58 | 72.5 | 70 | 73.9 | 128 | 73.3 |
| 15-19 | 61 | 59 | 120 | 45 | 73.7 | 23 | 38.9 | 68 | 56.7 |
| 20-24 | 88 | 84 | 172 | 65 | 73.8 | 56 | 66.6 | 121 | 70.3 |
| 25-29 | 82 | 80 | 162 | 62 | 75.6 | 61 | 76.2 | 123 | 75.9 |
| 30-34 | 93 | 90 | 183 | 77 | 82.7 | 73 | 81.1 | 150 | 81.9 |
| 35-39 | 63 | 49 | 112 | 48 | 76.0 | 37 | 75.5 | 85 | 75.9 |
| 40-44 | 68 | 68 | 136 | 48 | 70.5 | 38 | 55.9 | 86 | 63.2 |
| 45-49 | 76 | 62 | 138 | 56 | 73.6 | 40 | 64.5 | 96 | 69.6 |
| 50+ | 116 | 96 | 212 | 97 | 83.6 | 76 | 80.8 | 173 | 81.6 |
| Total | 914 | 853 | 1767 | 661 | 72.3 | 566 | 67.5 | 1227 | 69.4 |

X for sex = 7.2, df(1), $P < 0.05$.

X for age (0-19 versus > 20) = 41.3, df(1), $P < 0.001$.

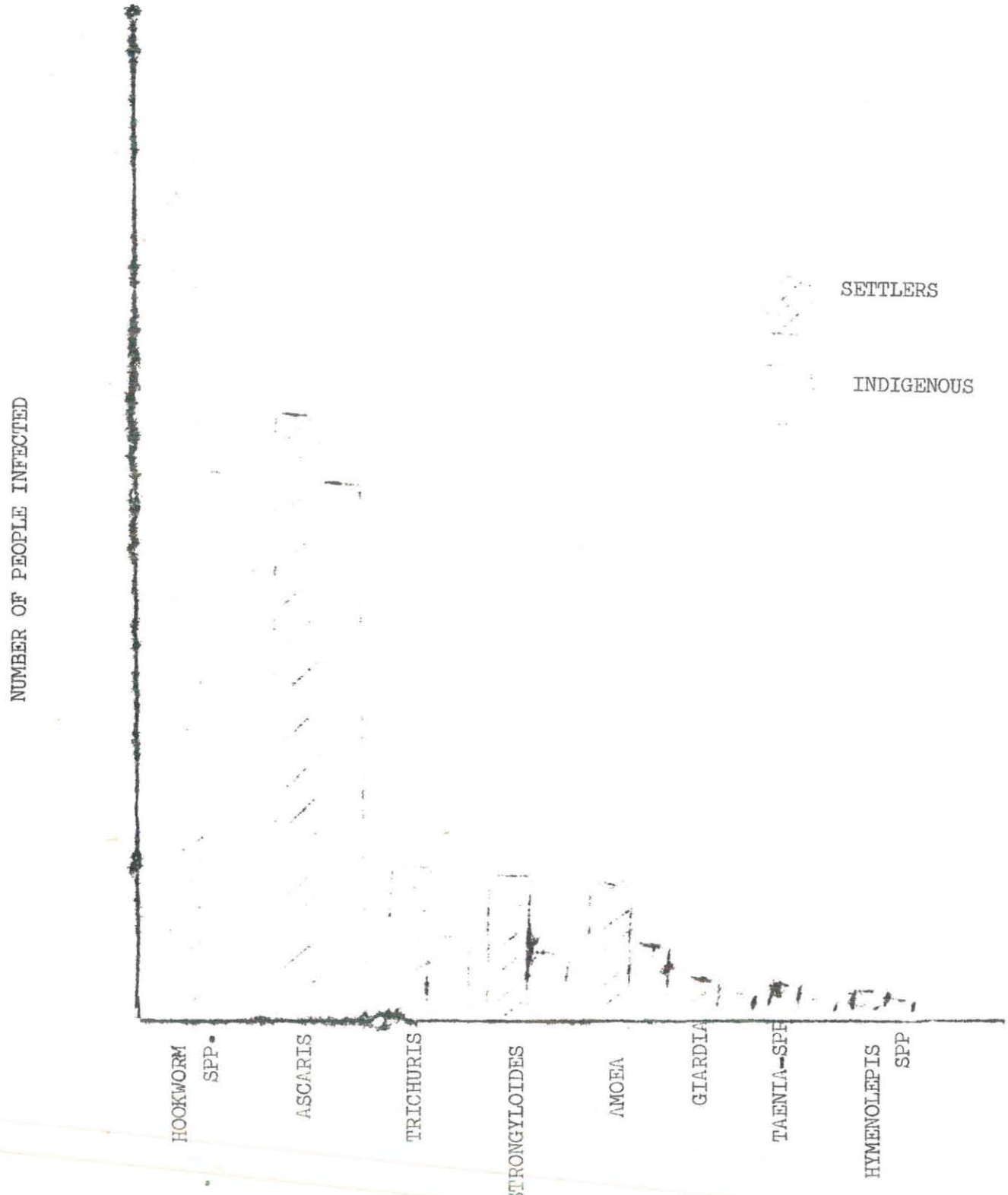
Table 33. Intestinal Parasitic Infection Point Prevalence Rate by Age and Sex Among the Indigenous 1987.

| Age In Years | Number Exam. | | Total | Positive | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | M + F | Male | | Female | | | |
| | No. | No. | No. | No. | % | No. | % | No. | % |
| 1 | 3 | 5 | 8 | - | - | 1 | 20.0 | 1 | 12.5 |
| 1-4 | 61 | 67 | 128 | 50 | 81.9 | 54 | 80.5 | 104 | 81.3 |
| 5-9 | 52 | 64 | 116 | 39 | 75.0 | 50 | 78.1 | 89 | 76.7 |
| 10-14 | 27 | 28 | 55 | 22 | 81.5 | 18 | 64.3 | 40 | 72.7 |
| 15-19 | 44 | 38 | 82 | 31 | 70.4 | 23 | 60.5 | 54 | 65.8 |
| 20-24 | 54 | 56 | 110 | 45 | 83.3 | 43 | 76.7 | 88 | 80.0 |
| 25-29 | 65 | 68 | 133 | 53 | 81.5 | 56 | 82.3 | 109 | 81.9 |
| 30-34 | 78 | 73 | 151 | 64 | 82.0 | 57 | 78.0 | 121 | 80.1 |
| 35-39 | 58 | 54 | 112 | 45 | 77.5 | 36 | 66.6 | 81 | 72.3 |
| 40-44 | 45 | 36 | 81 | 36 | 80.0 | 24 | 66.7 | 60 | 74.0 |
| 45-49 | 45 | 33 | 78 | 39 | 86.6 | 28 | 84.4 | 67 | 85.9 |
| 50+ | 42 | 38 | 80 | 34 | 80.9 | 26 | 68.4 | 60 | 75.0 |
| Total | 574 | 560 | 1134 | 458 | 79.8 | 416 | 74.3 | 874 | 77.1 |

X for sex = 5.2, df(1), $P < 0.05$

X for age = (0-19 versus > 20) = 3.2, df(1), $P < 0.05$

Figure 3. PREVALENCE OF SPECIFIC PARASITES IN SETTLERS AND IN INDIGENOUS



# CHAPTER V DISCUSSION

## 5.1 General

The ultimate objective of the strategy for Health For All by the Year 2000 is to improve the health status of all population and to reduce inequalities in health care both between and within countries (15).

Health status is not a term that is easily defined. Most people, even those who are familiar with health care, would consider it to be professional jargon. The major reason why it has eluded simple definition is the lack of agreed-upon definition of health. The broad definition of health proposed by the World Health Organization (WHO) in 1948 has been repeated. and supported for many years. Yet, few have tried to operationalize this definition so that it can be used to assess the level of health among groups of people (20). For the purposes of this study health status refers to the state of health of an individual, group or population measured against accepted standards- "indicators".

This study focuses on the health status of the newly resettled and the indigenous population in the South Western Ethiopia.

## 5.2 Response Rate

This study has a very high response rate of 99.3%, similar to that observed by Mekonnen et al (96.8%) in the Peasant's Producers Co-operative in Gondar (21). This was possible because of active participation by the communities studied and the active role played by the local party office, government officials and the community leaders.

## 5.3. Socio-Demographic Situation

The 1985 resettlement schemes were instituted on the basis of urgency to save the lives of the drought-stricken population of the northern regions. These people were moved to the fertile lands of the southern regions.

The majority of the settlers in Keto Settlement Complex were from Wollo Region. The average family size per household for the settlers was 3.4 which was significantly lower when compared to the family size of 4.1 in the rural Wollo. The family size for the indigenous (4.3) corresponded to that of the rural Wollega Region (4.7) (22). The lower family size of the previously drought-stricken settlers was probably attributable to deaths due to famine prior to settlement. As can be seen in table 1, preferential resettlement of younger families account for this difference in family size. The sex ratio revealed a greater predominance of males for the settlers compared to that of their former origin (105.9% versus 101.3%). But the sex ratio of the indigenous (97.2%) was similar to that of

the Wollega Region (91.4%) showing a predominance of women (22).

The burden of dependency ratio was 51.7% for the settlers and 58.3% for the indigenous. This was again the effect of famine and displacement where the younger-aged and the older-aged died in greater proportions.

The total burden of dependency ratio was 54.8% similar to the study in Gondar Region (21) which revealed more than half of the population was under 15 years of age. This is a typical picture of developing countries where there are more children (< 15 years ) than adults.

### 5.3.1. Literacy Status

The literacy status between the two groups was similar (32.6% and 33.4%) but low when compared to the national (over 60%) (23). However, beginners from both groups were not included; since this area is undergoing rapid settlement and villagization programs, the level of literacy should rise rapidly.

### 5.3.2 Religion

The majority of settlers were muslims while most of the indigenous were christians.

### 5.3.3. Climatic Condition

In regards to climatic condition of their former residence, 16.2% of the settlers came from highland and 53.1% from temperate climates while the whole indigenous population was from the lowlands. When people move from their permanent habitat to a new dwelling zone with different climatic conditions, the possibility of acquiring new parasitic or other new types of diseases is increased. This is supported by a study in a settled rural agricultural community in Sudan where most of the newcomers suffered from malaria and other diseases (24).

## 5.4. Housing, Water Supply and Sanitation

### 5.4.1. Housing Condition

In Keto Resettlement Villages and in the nearby farmers associations almost all of the houses were thatched-roofed and constructed with wood. The walls of more than half of the houses were not plastered with mud leaving many air spaces. This factor contributes to a high risk of mosquito-borne diseases.

### 5.4.2. Water Supply

When source of water supply to households was considered, the major sources of water supply were unprotected springs and rivers. Most of the settlers (50.8%) and the indigenous (52.6%) used unsafe water for drinking purposes. Eventhough, there are high government and NGO inputs in many sectors for the settlers, in regards to water supply, the situation was nearly identical to that of the indigenous. This was similar to the condition in most parts (80%) of rural Africa who have no access to safe water supply (25). With regard to distance traveled to fetch water,the indigenous had shorter distance to go. This situation is similar to other villagized areas (18). But for better health, it is of great importance to focus on the quality of the water supply. The provsion of good, clean plentiful water supply in a community is therefore of the greatest importance in public health service (26). Thus both stttlers and indigenous people need improvement in their water quality.

### 5.4.3. Personal Hygiene Practice

Personal hygiene practices, ie. washing the body and clothes showed very low standards both for the settlers and the indigenous. This indicates the need for greater input and effort in promoting good hygiene practices through health education (27,28,29). Eventhough , there are quite a good number of health institutions and health manpower in

the resettlement areas, creating change in attitude and practice through health education seems unsatisfactory at this time.

### 5.4.4. Excreta and Refuse Disposal Methods Used

Regarding utilization of latrine facilities, 95.6% of the settlers claimed to use private or shared pit latrines as compared to 50% of the indigenous population. Most of the latrines were common in both groups and had only been recently introduced. During our study due to lack of time and cost only availability was recorded.

Disposal of excreta is an important environmental health work, because human excreta are the source a large number of diseases transmitted through intestinal discharges (30). For better health, one must in addition use the latrines properly, drink clean water, and practise proper personal as well as domestic hygiene.

As far as utilization of refuse disposal was concerned, almost all of the settlers had private or common refuse disposal pits while very few of the indigenous had private or common refuse disposal pits. In villages of the indigenous population, availability of latrines and refuse disposal facilities were very limited as compared to the settlers . This marked difference could be attributed to attempts made to persuade the settlers to give attention to latrine and refuse disposal schemes.

Excreta and refuse disposal facilities in this study area was greater than what was reported in a study in Gondar (21). Eventhough more than 90% of the settlers had latrines and refuse disposal pits, still the infection rate in these population was found to be high. Misra in 1975 related similar achievements in India but stressed the need for community participation without which success was much less (27).

## 5.5. Health Status

### 5.5.1. Immunization Status

With regards to immunization coverage, among the settlers 66.2% were fully immunized and 5.6% were found to be defaulters as compared to 33.8% fully immunized and 21.6% defaulters among the indigenous. Health institutions were established in the resettlement areas after the launching of the resettlement program. The low coverage in the indigenous population was attributable to problems of geographical accessibility and social barriers to use the health facilities of the settlers. A study on immunization carried in Gondar (31) showed that less than 25% were defaulters. A base line survey carried out in addis Ababa showed drop-out rate of 23% (32).The success of the campaign reported in the study was the result of the cooperation of the Urban Dwellers Association in mobilizing the community. When the defaulter rate between the Urban Center, Gondar and the Keto resettlement was compared, the

settlers had better immunization coverage. This was due to the high input given by the government and the high number of NGOs operating in the area. Similar actions like those carried out in the above mentioned urban centers, ie. community mobilization must be encouraged in our study area to attain universal immunization coverage.

### 5.5.2. Antenatal Services, Place of Delivery of the Last Child, Person who assisted during the last delivery and birth during the year.

More than 90% of the settlers used antenatal care services while only 41.6% of the indigenous were using such services. A baseline survey carried out in Addis Ababa (32) showed that 76.8% of the women had attended antenatal clinic during their last pregnancy. In our study the settlers seem to have utilized the opportunity better compared to the indigenous and even compared to the residents of Addis Ababa. This again is probably due to the high government and NGO input in the area.

Eventhough there were adequate number of health facilities and health manpower in the resettlement areas, most of the settlers and indigenous women delivered their last child at home and 62.7% of the settlers and 83.4% of the indigenous were assisted by untrained personnel or family members. This important problem requires prompt attention through health education by health workers and REWA.

The crude birth rate was 50.9/1000 for the settlers and 48.3/1000 for the indigenous population This is slightly higher than the national average of 46/1000, (22) and suggests lower contraceptive practices. Overcrowding was the main reason for resettlement to this area by the settlers who came from Kembata and Hadiya (Shewa). In order not to repeat the same problem, strong family planning programs must be instituted rapidly in this area.

### 5.5.3. Marriage, Child Spacing, Family Planning and Breastfeeding.

The data on marriage indicated that 65.0% of the head of households of the settlers suggested that girls should get married before 16 years whereas all heads of the households of the indigenous suggested that girls should get married above the age of 16 years. The high crude birth rate observed in the settlers could be due to the early marriage practice by this population.

Settlers had wider child spacing as compared to the indigenous. Contraceptive prevalence was similarly very low in both groups, although somewhat better than other rural areas of Ethiopia. The difference in child spacing cannot therefore be attributed to difference in family planning practice.

However, as can be seen in Table 22, settlers breastfed considerably longer. The greater child spacing in the settlers is,in all likelihood,may be attributable to their prolonged duration of breastfeeding.

The higher proportion of women who know about family planning in the settlers are probably related to their improved access to health facilities. A study in Bangladesh in 1981 showed that 99% of married women claimed that they had heard of at least one efficient method of contraception, whereas only 11% of them were using such method (33). A study in Gondar city in 1986 showed that the majority of the women (65%) were aware of the existance of modern contraceptive methods, while 17% were current users (34). In our study, knowledge and practice of both groups were found low compared to the two quoted studies. This can explain the high birth rate reported. Thus to avoid the high birth rate and overcrowding which are two of the main problems of the developing world, it is of great importance to institute corrective measures by establishing family planning programs in this area and throughout rural Ethiopia.

### 5.5.4. Supplementary Foods for Infants

Breastmilk is the best and safest food for young babies. It is important that babies are given extra foods as well as breastmilk at the right age, and in sufficient amounts, to enable them grow and stay healthy. Too little food, given too late, or inadequate food with too few nutrients may lead to poor growth and malnutrition (35).

About one-third of mothers in both groups introduced supplementary foods before 6 months and about 90% after 8 months. This situation was not too different from the one observed in Gondar (21) which indicated that 18% of the mothers started supplementary foods before the age of 6 months and 90.4% of the mothers before 18 months. Clearly, 10% of children in both groups, ie. in settlers and in indigenous were at risk for malnutrition due to delayed introduction of solids.

In regard to the type of supplementary food given to children, 6.9% of the mothers from the indigenous gave abish as supplementary food to children while none of the settlers gave this type of food to children.

Milk was given as a type of supplementary food in about one-quarter of children in both groups. The type of milk given to children by the indigenous mothers was most often cow's milk and the settlers mothers was most often powdered milk obtained from donation.

Injera (the Ethiopian bread) was given as a supplementary food to 51.8% of indigenous children and to 38.3% of children of settlers. This injera was usually prepared for adults with scraps given to children. This insufficient attention to the feeding of children, in all likelihood, may be an important factor in childhood malnutrition.

### 5.5.5. Nutritional Status in Under-five Children.

Due to the 1984/85 drought situation in the northern regions of Ethiopia, the investigator saw the need for a survey to explore the nutritional status in settlers and in indigenous under-five children.

Nutritional status is a health indicatior. Anthropometric measurements to assess growth and development, particularly the physical growth and development of young children, are the most widely used indicators of nutritional status in a community (38).

The survey was conducted in 571 children of the settlers (50.2%) and 567 children of the indigenous (49.8%) from the total of 1138 under-five children. In the children of the settlers 40.1% were found stunted, 26.3% wasted and 4.2% stunted and wasted whereas in the indigenous 40.6% were stunted, 26.5% were wasted and 7.2% were stunted and wasted. In both groups acute and chronic malnutrition was manifested and there was no difference nutritionally (P >

0.05). Our study had almost a similar pattern as the one in Gondar (21) which showed that over half of the pre-school children were either nutritionally wasted, or "stunted", or stunted and wasted. This situation could be explained by many factors which may directly or indirectly account for malnutrition: the famine in the northern region had affected the settlers nutritional status, the frequent diarrhea morbidity experienced by both groups, the late start of supplementary food, and insufficient attention given to children in their feedings, food taboos, the high proportion of the younger vulnerable groups, low rate of food production due to primitiveness of farming practices, ignorance about health, family planning, nutrition and the prevalence of infectious diseases. These and others could be the major factors in predisposing children to malnutrition.

### 5.5.6. Morbidity and Mortality Rates

#### 5.5.6.1. Morbidity Rates

The heads of households of the two groups of population were questioned about any type of illness experienced by any family member in the past two weeks. As a result, the prevalence rate of perceived morbidity for the settlers was 251.9/1000 and for the indigenous 196.6/1000. In a study conducted in Gondar (21) prevalence rate of perceived morbidity was 373/1000. In report on the Rural Health Survey (1982/83) (39) the prevalence rate of

perceived morbidity for Wollo was 271.4/1000 and for Wollega was 481.8/1000. In this study, low prevalence rate of perceived morbidity in both groups is observed. Eventhough the settlers had good access to health care, they reported much more morbidity. This could be explained by climatic and social change.

### 5.5.6.2. Diarrhea Episodes in Under-five Children

In the two groups of population, mothers were questioned about diarrhea episodes in under-five children in the past two weeks. From the settlers 60.5% mothers and from the indigenous 63.3% mothers explained that their children had one or more diarrhea episodes in the last two weeks. Eventhough settlers had better health and other facilities compared to the indigenous, as far as diarrhea episode in under-five children was concerned, they appeared to be in similar conditions. R.G. Feachem et al in 1984 (40) after reviewing 35 studies in 14 countries on the relative risk of diarrhoea morbidity found the following: "83% of the children with no breastfeeding had diarrhoea compared to those of breastfed". In his three-country study, the same author in 1984 (41) suggested that: "hygiene education is effective in diarrhoea morbidity reduction". Thus, to attain satisfactory result in reduction of diarrhea morbidity in children, it is very important to encourage breastfeeding and to follow proper personal and domestic hygiene.

5.5.6.3. Mortality Rate

The crude death rate of both groups (settlers 21.1/1000 and indigenous 19.5/1000) were similar to the national average (18.1/1000) (39,42). This was very reassuring as one could have expected a higher death rate. Potential reasons for this could be: 1) A previously higher death rate during the famine with the more robust individuals surviving; 2) good food supply; 3) good access to health services.

5.5.7. Prevalence of Intestinal Parasites

Out of all subjects who submitted stool specimen for laboratory test for ova and parasites, 69.4% and 77.1% of the settlers and the indigenous populations were positive for one or more parasites respectively. This difference in prevalence rate was statistically significant ($P < 0.001$). When this was compared to some studies done elsewhere in the country, it was similar to those studies by Kloos et al (43) in Awash valley ranging from 54-70% and Gebresellassie (44) (87-90.3%) in Gondar Region. When prevalence by sex is computed, 72.3% of the males and 67.5% of the females were positive among the settlers and whereas in the indigenous, 79.8% of the males and 74.3% of the females were positive. Marked statistical difference ($P < 0.05$) was noted by sex This was similar to the study done by Zein et al in Gondar (45). The high prevalence rate of intestinal parasites in males compared to females could be

explained due to the nature of the work they perform, men in the fields and females in the house which exposes males to geohelminths.

With regards to multiple infestations 30.0% of affected settlers had two or more parasites as compared to 28.9% for the indigenous. Eight parasites accounted for all infestations. The commonest parasite was hookworm (37.2% in the settlers and 38.0% in the indigenous, Figure 3). This similar infestation rate by hookworm in both groups was related to the nature of the work in the field.

In this study infestation by hookworm was found to be higher than the other parasites. Even higher infection rates of 70-79% of hookworm were observed in different localities of Gambela Awraja which boarders Kelem Awraja in the south (46). The high rates of hookworm could be due to the warm climate and favorable soil for its reproduction.

In our study schistosomiasis was not found. It is consistent with an earlier study in Dembidollo and Gidami which are 65 km south and 100 km west of Keto settlement respectivily. None of the 305 people tested showed evidence of schistosomiasis (47). Similarly schistosoma mansoni was fund to be endemic along much of the northern routes along the central plateau but was essentially absent from communities on the southern end of the plateau (48).

Although adequate sanitation facilities were available for the settlers, these high infection rates suggest that they are not properly used and that preventive measures were not enforced.

The short comings of such studies could be improved by conducting cohort studies. In regard to stool examination Reche and other concentration methods could have reliable results better than direct method. As far as latrine is concerned availability alone can not confirm proper usuage. Therefore, for proper usage observation to each latrine is very important.

# CHAPTER VI CONCLUSION AND RECOMMENDATION

## 6.1. Conclusion

The health status of the newly resettled and the indigenous population in Keto Resettlement area was studied from an epidemiological point of view. The study was conducted using several variables, ie. Socio-demographic, health status, nutritional status in under-five children and examination of stool for ova and parasites.

The socio-demographic characteristic revealed the predominance of males in settlers and females in the indigenous. The literacy status was low in the two groups compared to the National level. The predominance of males could be the result of displacement of the settlers. Education is the basis of development; the situation of the settlers and the indigenous looks promising since the start of the present literacy campaign.

Health status variables like immunization coverage, antenatal attendance, family planning services and health facilities in general were better organized in the settlement areas. This improved access to health services is likely to expand to the indigenous population who were denied this service for a long time.

Water supply, personal hygiene and environmental sanitation were at low standards both in the settlers and in the indigenous. The available health facilities and health personnel could change the situation through proper health education and multisectoral development.

High prevalence of both acute and chronic malnutrition was manifested in both groups. This problem is likely to be solved through the involvement of other sectors to collaborate with the communities to change their attitudes and practices towards better food production and feeding practices. When prevalence of intestinal parasites in the two groups was examined, it was more than 70% in each group. More than 90% of the households of settlers had latrine when compared to 50% of the indigenous.

Since latrines were introduced recently in these communities, they were not yet utilized properly. As the two groups come to understand the benefits of latrine use, this situation should change and the prevalence of intestinal parasites should decrease significantly.

### 6.2. Recommendations

Due to the urgency of the problem the settlement program in Ethiopia had been established without considering all of the potential health outcomes of settlers in the new area. The present findings will be of value as baseline information and indicators for future activities to be carried out in line with Primary Health

Care programs. With the socio-economic development in the country, it is the right time to plan and set priorities for Primary Health Care in cooperation with others involved in development. We therefore make the following recommendations.

6.2.1. The assessment of resettlement at this initial stage not only helped assess existing health situations, but also helped develop appropriate indicators to assess prevailing situations and develop appropriate preventive measures. Hence, future resettlement and villagization programs should initially institute epidemiological study on the area targeted for this program.

6.2.2. The major problem in developing countries nowadays is rapid population growth. This problem exposes developing nations to overcrowding which results in shortage of food and disease. In this study the settlers from Shewa (Kembata and Hadiya) were resettled to the new area because of overcrowding and inadequacy of land for cultivation. However, in this settlement scheme high population growth was observed among the settlers. Therefore, there is an urgent need to implement effective family planning programs not only in resettled areas, but throughout the country.

6.2.3. It was noted that there was less access to the indigenous population to the conventional health units when compared to settlers. The government and nongovernmental organizations should urgently address themselves to this problem and provide equity in access to health services.

6.2.4. Intestinal parasites in this area require special follow-up and intervention. Urgent attention should be given to latrine construction (one per family) and to the relevant health education. Hookworm was more prevalent in this area, especially in high risks groups ie. pregnant and lactating women and children.

6.2.5. In this study a high prevalence of malnutrition was manifested in the two groups, eventhough settlers were supported by the government and NGOs. As settlers become self-supporting in food production, both the government and international agencies will have to pay sufficient attention to up-grade the level of nutrition through health education and a multisectoral approach.

6.2.6. All the houses of the settlers and almost all the houses of the indigenous were found thatched-roof and constructed with wood. Therefore, it will be of great importance to introduce sun-baked brick to settlement villages and in general to the rural Ethiopia to construct houses. This will decrease the demand for wood and prevent massive deforestation in the country.

6.2.7. Literacy level ie. reading and writing in both groups was found low. We should not only strive to increase the literacy level but also introduce functional literacy, dealing with subjects pertinent to their new community life, such as agriculture, water and other productive activities.

6.2.8. More than half of the population of both groups get unsafe water supply. To improve this situation the available springs must be protected, shallow wells dug and equiped with hand pumps and where these simple techniques are not feasible, deep wells should be bored or treatment plants installed.

Implementing these recommendations could improve considerably the health status of settlers.

# CHAPTER VII APPENDICES

## Appendix 7.A. Back Ground Information

### Appendix 7.A.1. Health Facilities in the Resettlement Villages

For the 20 settlement villages, there is one health center in Chanka staffed with 2 physicians, 5 nurses (the 2 doctors and 1 nurse are French by nationality), 1 Sanitarian, 1 laboratory technician, 10 health assistants and 3 nutrition workers. The health center has 28 beds for inpatients. In addition to the health center, there are 9 health stations in the 20 settlement villages distributed 1 for 2 settlement villages which are staffed by 2 health assistants each. The next higher health facility is Dembidollo Hospital which is located about 65 Kms. away from the settlement villages.

Appendix 7.A.2. Temperature of Alem Teferi Town 1987

Temperature of Alemteferi Town
1987 in $^{o}C$

| MONTH | MEAN MAX. t | MEAN MIN. t |
|---|---|---|
| Jan. | 30.8 | 12.6 |
| Feb. | 32.3 | 12.7 |
| Mar. | 33.5 | 15.1 |
| Apr. | 32.3 | 14.2 |
| May. | 29.4 | 15.8 |
| June | 27.2 | 15.8 |
| July | 25.7 | 14.3 |
| Aug. | 25.6 | 13.8 |
| Sept. | 26.5 | 13.8 |
| Oct. | 28.2 | 13.0 |
| Nov. | 29.0 | 12.5 |
| Dec. | 30.0 | 11.6 |
| Total | 350.5 | 163.8 |
| Average | 29.2 | 13.7 |

Source : National Meteorology Service Agency.

Apendix 7.A.3. Rainfall of Alem Teferi and Chanka Towns 1979-1987.

Rainfall of Alemteferi and Chanka Towns 1979 - 1987 in mm.

| YEAR | RAINFALL ALEMTEFERI | RAINFALL CHANKA |
|---|---|---|
| 1979 | 1599.2 | 1591.7 |
| 1980 | 1221.3 | 1318.1 |
| 1981 | 1903.6 | 1405.9 |
| 1982 | 1670.6 | 1642.2 |
| 1983 | 1502.2 | 1415.1 |
| 1984 | 1465.1 | 1003.9 |
| 1985 | 1765.4 | 1450.9 |
| 1986 | 834.7 | 1200.5 |
| 1987 | - | 1580.4 |
| Total | 11962.1 | 12616.8 |
| Average | 1495.3 | 1401.9 |

Source : National Meteorology Service Agency

## Appendix 7.B. Methodology

### Appendix 7.B.1. Questionnaire

Keto settlement village and indigenous villages, around the settlement complex, health status study questionnaire 1987.

Questionnarie Number

1. Name of household head .... House NO.

2. Age

3. Sex

4. Family members of the household

| S.No. | Name | Age | Sex | Relationship |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |

5. Literacy status of household head

Literate/read and write

Illiterate

6. Religion of household head

Christian Muslim

7. For settlers, from which region did you come?

Wollo ☐ Shoa (Kembata and Hadiya) ☐

8. Climatic condition of your residential area (for settlers-former)

Highland ☐ Temperate ☐ Lowland ☐

9. Type of housing.

9.1. Corrugated iron roof Constructed with wood

Plastered with mud ☐

Not " " " ☐

9.2. Thatched roof constructed with wood

Plastered with mud ☐

Not " " " ☐

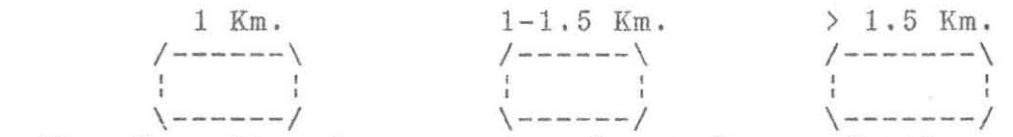
10. Source of water supply

Protected well ☐ Unprotected well ☐

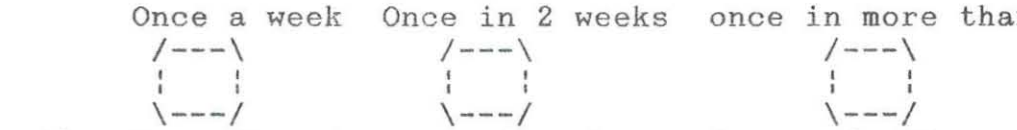
Protected spring ☐ Unprotected spring ☐

River ☐

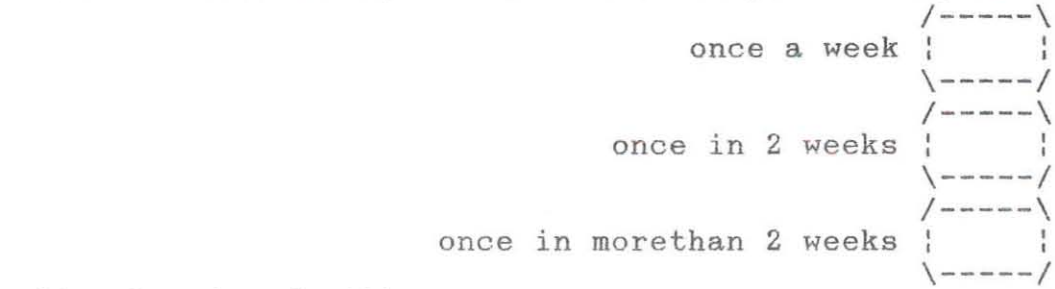
11. How far do you go to fetch water?



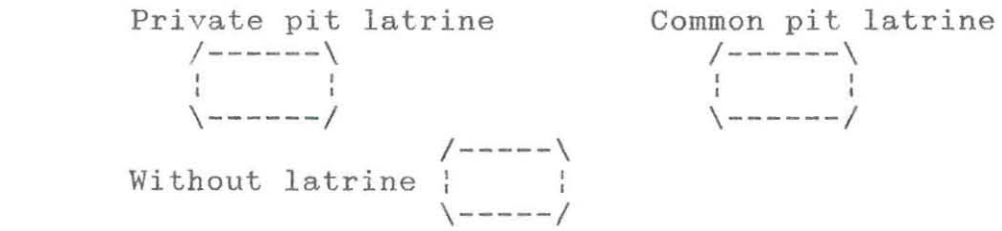

12. How often do you and members of your family wash clothes?



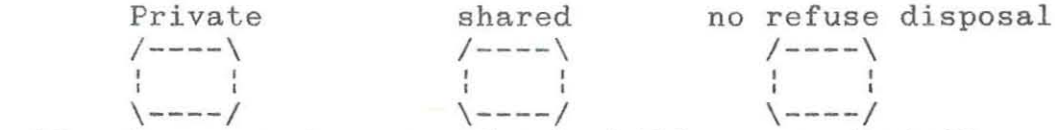

13. How often do you and members of your family wash the body?




14. Latrine facility

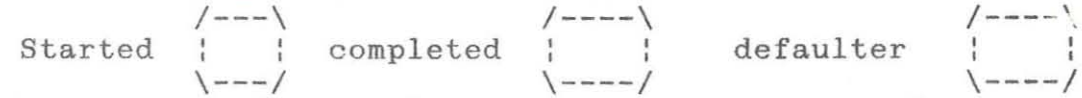



15. Availability of garbage disposal pits

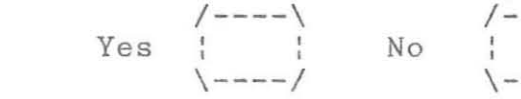



16. Do you get your under-2 children vaccinated?


17. If Yes, with reference to cards




18. Do women during the last pregnancy get vaccinated?



19. Did you attend an antenatal clinic during your last pregnancy?

Yes ☐ No ☐

20. Where did you deliver your last child?

Health Institution ☐ Home ☐

21. Who assisted you during your last delivery?

Trained health professional ☐

Non Trained health Professional ☐

22. For how long did you breast feed your child?

< 1 year ☐ 1 year ☐ 2 years ☐ 3 years ☐

23. At what age (month) did you start supplementary food to your child?

< 2 months ☐ 2-5 months ☐ 6-8 months ☐ 9-12 months ☐ > 12 months ☐

24. What type of supplementary food did you give to your child?

Milk ☐ porridge ☐ Injera/bread and milk ☐ Injera/bread ☐ abish ☐

25. At what age do females get married?

< 10 years ☐ 10-15 years ☐ 16-17 years ☐ > 18 ☐

26. What is the age difference between your two last children?

1 year ☐ 2 years ☐ 3 years ☐ 4 years ☐ > 5 years ☐

27. Knowledge and utilization of family planning

Know and use it ☐

Know but do not use it ☐

Do not know ☐

28. Was there any birth during the year (October 86- September 1987 in this household?

Yes ☐ No ☐

If Yes, How many ☐

29. Was there any person ill in this household within the past 15 days any type of illness of all age and sex?

Yes ☐ No ☐ If,yes, how many ☐

30. Was there any child (< 5 years) having diarrhea for the last 15 days in this household?

Yes ☐ No ☐

31. If Yes, once ☐ twice ☐ 3 times ☐ 4 & above ☐

32. Did any person die within one year (October 86 - September 87) in this household including babies.

Yes ☐ No ☐

If yes, how many ☐

33. Weight, height and age measurement of under-five five children

| S. No. | Name | age | sex | Weight(kgm) | Height(cm.) |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |

34. Stool examination to household members for identification of intestinal parasites

| S.No. | Name | Age | Sex | Parasites identified |
|---|---|---|---|---|
| 1 | | | | 1 |
| | | | | 2 |
| | | | | 3 |
| | | | | 4 |
| 2 | | | | 1 |
| | | | | 2 |
| | | | | 3 |
| | | | | 4 |
| 3 | | | | 1 |
| | | | | 2 |
| | | | | 3 |
| | | | | 4 |

Appendis 7B.2.

**Distribution of households by origin**

| Region | Number of households | Households included in the survey |
|---|---|---|
| Wollo (settkers) | 1857 | 485 |
| Shewa (settlers) | 430 | 112 |
| Wollega (indigenous) | 1544 | 403 |
| Total | 3831 | 1000 |

**Households represented in the study villages by origin**

| Settlers | | | Indigenous | |
|---|---|---|---|---|
| Village Number | Number of households | | Village | Number of households |
| | Wollo | Shewa | | |
| 3 | 129 | - | Chanka B. | 93 |
| 8 | 71 | 98 | Dogano A. | 83 |
| 9 | 78 | - | Mechara | 76 |
| 13 | 104 | 14 | Wacho | 75 |
| 19 | 103 | - | Awetu | 76 |
| Total | 485 | 112 | | 403 |

## Appendix 7.C. Definition

| | |
|---|---|
| Disaster area - | An area officially declared to be the scenes of an emergency created by a disaster and therefore qualified to receive certain type of governmental aid. |
| Drought - | A prolonged period of dryness |
| Famine - | An extreme scarcity of food |
| Belg _ | Small rain harvest period. |
| Meher _ | Main harvest season. |
| Settlement - | The act or process of settling people from one place to the other. |
| Rehabilitation - | The action or process of restoring to a former capacity. |
| Health - | Is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. |
| Health Status - | Is the general term for the state of health of an individual , group or population measured against accepted standards "indicators". |
| Literate - | One who is able to read and write |

aged 8 and above, according to Ministry of Education.

Abish - A type of seed, where the water after boiling is given to children with honey by some mothers traditionally.

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DECLARATION

I, the undersigned, declare that this thesis is my work and that all sources of material used for this thesis have been duly acknowledged.

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