

Strengthening Emergency Response Abilities
SERA Project

Vulnerability Profile: SUMMARY

Fedis Woreda (district)
East Harerge Zone
Oromiya Region

2000

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A. SUMMARY OF MAJOR FINDINGS

1. Introduction

This chapter attempts to summarize major findings from different data sources to identify vulnerable groups and vulnerability factors. The basic reason behind assessing a set of data from different sources on a certain issue is to examine how they complement each other in answering the following leading research questions, which guided this research activity. These are:

- Who are the vulnerable to a particular hazard?
- Where do they live?
- What are the factors most highly associated with their vulnerability?
- Why/how do they become highly vulnerable?
- When do they face these hazards most frequently?
- What kind of coping strategies do they use in response to their vulnerability?

The answers to these research questions will lead to indicators of vulnerability. These indicators of vulnerability can be categorized into six major content areas. Each major content area has many specific indicators. These major content areas are: demographic and socio-cultural, physical and climatic, economic and agricultural, institutional or program, disease/ malnutrition, and disaster history.

Data utilized in the preparation of this vulnerability profile were collected from two major sources. These are the primary and secondary sources. Two common methods of primary data collection methods were employed in the primary data collection part. These were the household survey and the rapid rural appraisal techniques. In the household survey two sets of questionnaires: the household survey questionnaire and the individual women's questionnaire were used. In rapid rural appraisal, community group discussions and key informant interviews were conducted to gather opinions of community leaders and key informants. Secondary data were gathered from archives of various government offices, departments and other related sources.

The quality of these data varies from one type to another depending on a number of conditions. These conditions include the expertise of the collecting agency, time and the purpose for which they were gathered.

Primary data are of better quality than secondary data as the collection and management of the former were controlled by the SERA project while those of the latter were outside the control of the project.

The organization of this vulnerability profile is such that different sections were written based entirely on data gathered from one source by one or two types of methods. Specifically, chapter four is based on data collected from secondary sources, chapters five and six are based on data collected by the rapid rural appraisal technique, and chapter seven is based on data from the household survey.

As the nature and quality of data collected from different sources and by different methods vary, it is expected that different figures for the same indicator can appear in this same profile. This forms the basis for the need to integrate and triangulate the different sources of data. In integrating these data an average was taken in cases where more than one, but fairly similar figures exist for one indicator. When there are large gaps among the different figures, only one figure that appears reliable is chosen. The basis for choosing one and discarding the others is comparison with corresponding figures for zonal and regional levels. When a need arises for trend analysis, data from different sources were arranged in time sequence. In cases where most recent data are needed, the household survey data are utilized.

2. Population pressure, natural resources and environmental stresses

There are established theories that explain the relationship between population size, natural resources and environment. As population size increases natural resources are overexploited, land holding is fragmented, living trees are cut down for fuel and construction purpose, fallow periods are shortened, croplands are over ploughed, grasslands are over-grazed by livestock. Chopping down of trees and general deforestation will in turn, contribute to unfavorable changes in climatic conditions. One of the outcomes of such changes is shortage of or irregularities in rainfall. In general the current pace of population growth and its impact on natural resource remains to be one of the hot issues on national and international forums.

The population of the district of Fadis was 150,253 in 1994 (CSA, 1994). It was projected to reach 178,194 in the year 2000. This is an increase of about 19 percent in 6 years. In view of the depletion of resources, recurrent drought, famine, and declining land productivity, the rate of population growth in the district is considered to be high.

In addition to the above, the perception of the community group discussants revealed the prevalence of rapid population growth in the district, which is reflected in large family sizes. According to the 1994 census the average family size in Fadis District was 5.02. This indicates high population pressure that can be a real challenge given the recurrent drought that made the people food insecure.

The proportion of the total population that is economically dependent can also reflect rapid population growth. The proportion of the total population that is aged 15-64, that is economically active, accounted for about 49 percent in 1994. That made the overall dependency ratio 103.6 percent.

The total land area of Fadis District is 1975.92 square kilometers. The effect of population pressure on natural resources can also be reflected in terms of the increasing number of persons per unit area of land and the decrease in per capita land holding size. The crude density of population increased from about 76 persons per square kilometer of land to 90 persons per square kilometer of land in the six years from 1994 to 2000. The pressure of population on land becomes more evident when density is limited to cultivated land. Agricultural density, that is, the ratio of rural population to cultivated land increased from about 427 persons per square kilometer of cultivated land in 1995 to 878 persons per square kilometer of cultivated land in 1999. The reason behind the over 100 percent increase in agricultural density was the large decrease in the size of

cultivated land in 1999 while the reason behind low crude density is the presence of large area of land with sparse population settlement in the southern vast lowlands. These figures indicate that drought has been the most important cause of environmental stress compared to population pressure.

Land holding size is another element that explains the relations between population and natural resources. An increase in the size of population brings about the formation of new households that will share the available farmland. This will over time make per capita land holding smaller and smaller. This will have a negative impact on food availability. In the district of Fadis about 47 percent of the sample households reported that the size of their holding is less than or equal to half a hectare. Results of the survey further revealed that the average land holding size in the study area is 0.44 hectare and this figure is 0.47 and 0.39 hectare for lowland and midland areas, respectively. This shows that lowland areas have relatively better holding sizes than the midland areas.

Table 1 Indicators of population pressure, natural resources and environmental stresses, Fadis district (2000)

| Topic and indicator | Years | | | Total |
|---|--------------------------------|-----------|-----------|-------|
| | 1994 | 1997 | 2000 | |
| <i>1. Population Pressure</i> | | | | |
| <i>1.1 Dependency ratio (Rural)</i> | 103.6 | | 103.7 | |
| <i>1.2 Crude density</i> | 76 | 83 | 90 | |
| <i>1.3 Agricultural density (rural persons per km² of cultivated land)</i> | Years | | | |
| | 1995 | 1996 | 1998 | |
| | 427 | 421 | 878 | |
| <i>2. Pressure on land</i> | Current levels by agro ecology | | | |
| | Highland | Midland | Lowland | |
| <i>2.1 % HHs owning less than 0.5 ha</i> | - | 48.3 | 18.2 | 28.2 |
| <i>2.2 Grazing land (Livestock head/ha)</i> | - | 776 | 38 | 55 |
| <i>3. Migration (aged 15 – 49 years)</i> | - | | | |
| <i>3.1 % HH with permanent out migrants</i> | - | 1.5 | 2.5 | 2.2 |
| <i>3.2. % HH with seasonal out migrants</i> | - | 26.7 | 27.8 | 27.5 |
| <i>4. Land degradation</i> | | | | |
| <i>4.1 % Severe change in soil fertility</i> | - | 65.5 | 20.9 | 35.8 |
| <i>4.2 % Severe change in level of erosion</i> | - | 60 | 11.5 | 27.6 |
| <i>5. Environmental change (% Severe environmental stress)</i> | Years | | | |
| | Before 1974 | 1974-1991 | 1991-1999 | |
| | 10 | 13.75 | 13.83 | |

The shortage of land leads to over-cultivation of the available land and clearing of vegetation cover in need of more cultivable land, which in turn results in deterioration in soil fertility, and degradation of the environment in general. More than 27 percent of the surveyed households reported that there has been fast increase in the level of soil erosion and 35 percent reported that there has been decline in soil fertility on their main plots since they started farming.

The opinion survey in the rapid rural appraisal revealed that 14 percent of the participants believe that there has been severe environmental stress in the area.

In addition to this, the attempt made to assess the perceptions of key informants on the degree of soil erosion in three selected periods (before 1974, 1974-1991 and 1991- 1999) revealed that its severity has been increasing over time. The rate of deforestation in the study area is also perceived as steadily increasing and the problem of pasture has also been increasing throughout the reference period. According to the data obtained from the district agricultural office forest and woodland cover accounts for only 1.2 percent of the total area in the year 1999.

In general, decrease in sizes of farm plots, over- cultivation, over- grazing, the ever deteriorating soil fertility, associated with recurrent drought and low level of modern technology will continue to worsen the food security situation in the district.

3. Access to services, infrastructure and their quality

The basic services that will be covered under this sub- topic include education, health, agricultural extension service, transport and communication services and potable water supply.

3.1 Educational services

One of the basic social services for any society is education. The access and quality of this service are usually measured by a number of indicators. These indicators include literacy status, access to primary education, primary school enrollment ratios, rates of dropout, student-classroom ratios and student-teacher ratios.

According to the 1994 Census, the proportion of the population aged 10 years and above that can read and write was about 4 percent. It was five percent for males and only three percent for females. This was indeed very small compared to the Oromiya regional figure of 22.4 percent and the East Hararge zonal figure of 12.2 percent. In addition to this, the SERA project survey indicated that only 3.8 percent of the population was literate in 2000. The gap between males and females was very large in this case. Six percent of males and only 1.6 percent of females aged above 6 years were literate.

Access to primary school is one aspect of educational service and it is the key element in the provision of the service. The data obtained from the district educational office indicated that there were 28 primary schools in the district in the year 1999. This yields an overall school density of nearly one primary school per 71 square kilometers without considering their distribution.

According to the same data source, gross enrollment ratio in the district was very low. Gross enrollment ratio for boys was about 12 percent while it was only six percent for girls in 1996. These ratios increased to 22 percent for boys and 10 percent for girls in 1999. Although the level is still very small compared to other districts in Oromiya, the progress has been considerable.

The other indicator of educational performance is the rates of dropout. It is measured by the difference between the number of students who entered grade one before four years and that of those who completed grade four. The rate of dropout is quite high in the

district. The rate of dropout in 1997 was about 86 percent for boys and 87 percent for girls while in 1999 it became 65 percent for boys and 77 percent for girls

Student- classroom and student- teacher ratios are also the most commonly used indicators of the quality of the educational services. In Fadis district, these indicators increased from 33 to 46 and from 27 to 45, respectively, between 1995 and 1998.

The community focus group discussion regarding the functional adequacy of primary schools in the study area revealed that some of the schools are old and suffer from lack of maintenance while both the old and new schools suffer from shortage of human and material resources.

In general, the supply of educational services is far from adequate. The apparently low student classroom and student teacher ratios make it appear that the quality of education is relatively good. When the enrollment and dropout ratios are taken into account, however, it becomes clear that the number of boys and girls who come to schools affects these measures of quality. Girls are at a much more disadvantaged position than boys.

3.2 Health services

The health sector is another basic aspect of the life of a society. The services provided in this sector play a determinant role in the socioeconomic development of an area.

In terms of physical availability of health institutions, there are four clinics, two drug shops, one hospital and one health center in the district.

There was no significant change in the number of health institutions in the five years period from 1994 to 1998 in the district. The only change was in the number of clinics from 3 to 4 in those five years.

The number of health personnel working in these institutions decreased from time to time. In the year 1998 there were 7 nurses, 8 health assistants, and 6 laboratory technicians. According to this data, the ratio of population to nurses, health assistants, and laboratory technicians was about 24,048, 21,042 and 28,057 respectively in the year 1998. These figures show that the number of health personnel is very small in relation to the population size of the district.

Another very important aspect of health service availability is the provision of preventive health services. This service includes antenatal care for pregnant women and immunization of children. The proportion of pregnant women with at least two doses of TT2 never exceeded 25 percent, in spite of the relatively better access to service giving institutions in the district. It was 12.2 percent in 1995, 24.5 percent in 1996, 17.1 percent in 1997, 16.2 percent in 1998 and 23.1 percent in 1999. From these figures one can understand that there is a low level of TT2 immunization.

Immunization of children is still at a very low level. An exception to this is the vaccination against polio. At the time of the household survey, 86.5 percent of children aged less than 5 years were reported to have had at least one shot of polio vaccine. But the corresponding proportion with three shots of polio vaccine was 30.8 percent. Polio vaccination is currently being carried out in campaigns and that is why vaccination against polio is more successful than the others.

The proportion of children with DPT3 is usually taken as a good indicator of the completeness of immunization against the common child diseases. Data gathered by the household survey in February 2000, revealed that the proportion of children aged 12 – 23 months who had 3 shots of DPT vaccination was only 9.6 percent. Among the same children the proportion with BCG vaccination was 21.2 percent.

Community group discussants revealed that the overall trends in the provision of health services showed improvement over time compared to the past five year prior to the survey. But due to the shortage of manpower, medicine and other material supplies, the quality of the services is still at a low level.

Table 2 Indicators of access to basic services and their quality, Fadis district (2000)

| <i>Topics and Indicators</i> | | <i>Current levels by agro ecological zones</i> | | | |
|--|------------------|--|-----------------|-----------------|--------------|
| | | <i>High land</i> | <i>Mid land</i> | <i>Low land</i> | <i>Total</i> |
| <i>1. Education</i> | | | | | |
| <i>1.1 Percent literate (Pop aged 7yrs+) in year 2000</i> | <i>Males</i> | | 9.5 | 4.5 | 6 |
| | <i>Females</i> | | 1.8 | 1.5 | 1.6 |
| | <i>Both</i> | | 5.8 | 3.0 | 3.8 |
| <i>1.2 Trends in enrollment and dropout over years (in percent)</i> | | <i>Years</i> | | | |
| | | <i>1996</i> | <i>1997</i> | <i>1998</i> | |
| <i>Enrollment (Pop aged 7-14 years)</i> | <i>Males</i> | 12.8 | 14.7 | 21.9 | |
| | <i>Females</i> | 5.8 | 8.1 | 10.5 | |
| <i>Dropout (Grades 1 – 4)</i> | <i>Males</i> | 86 | 73 | 65 | |
| | <i>Females</i> | 87 | 82 | 77 | |
| <i>1.3 Number of students per teachers</i> | | 27 | 35 | 45 | |
| <i>2. Agricultural Extension programs</i> | | | | | |
| <i>2.1 % Involved in Food crop extension</i> | | 0.6 | 3.5 | 7.8 | |
| <i>2.2 Farmers-development agent ratios</i> | | 3834 | 1928 | 1462 | |
| <i>2.3 % Received assistance for improving agriculture or livestock production in the previous 5 years</i> | | <i>Agro ecological zones</i> | | | |
| | | <i>High land</i> | <i>Mid land</i> | <i>Low land</i> | |
| | | - | 0.5 | 1.7 | 1.31 |
| <i>% Of households received credit services in last 5 years</i> | | - | 0 | 1.5 | 1.0 |
| <i>3. Basic services (Average weighted score as percent of total possible)</i> | | - | 64.9 | 36.2 | 50.9 |
| <i>4.1 % of Pregnant women immunized (TT2)</i> | | - | 19 | 26.6 | 23.8 |
| <i>4.2 % Of young children aged 12-23 months immunized</i> | <i>BCG</i> | - | 25.6 | 18 | 21.2 |
| | <i>Polio</i> | - | 90.7 | 83.6 | 86.5 |
| | <i>Polio (3)</i> | - | 27.9 | 32.79 | 30.8 |
| | <i>DPT</i> | - | 32.6 | 19.7 | 25 |
| | <i>DPT (3)</i> | - | 9.3 | 9.84 | 9.6 |
| <i>5.1 % Of ill women sought medical care in the previous 2 weeks</i> | | - | 1.1 | 11.8 | 8.2 |
| <i>% Of ill children sought medical care in the previous 2 weeks</i> | | | 16.2 | 19.4 | 18.2 |

| <i>Topics and Indicators</i> | <i>Current levels by agro ecological zones</i> | | | |
|---|--|----------------|------------------|------|
| <i>6. % Of (women aged 15-49 years ever used any family planning method</i> | | 0 | 0 | 0 |
| <i>7.1 Pop with access to potable water (%)</i> | - | 78.5 | 3.3 | 28.1 |
| <i>7.2 Rural population with access to potable water(%)</i> | <i>Years</i> | | | |
| | <i>1994</i> | <i>1996/97</i> | <i>1999/2000</i> | |
| | <i>11.6*</i> | <i>---</i> | <i>38**</i> | |

** Obtained from CSA, 1996*

*** Obtained from Mines and water resources development, 2000*

3.3 Agricultural extension services

Agricultural extension services that are directed at boosting agricultural production through the dissemination of modern inputs started very recently. Food crop and natural resource conservation extension programs have been conducted since 1996 in Fadis District. The proportion of the total cultivated land that is covered by the program is small. As a result, the contribution of the program to the total production is insignificant. However, the major achievements were the increasing number of development agents and, as a result, the declining farmers-to-extension agents ratios. There were 9 development agents in 1995 and this number increased to 24 in the year 1998. In spite of the high increase in the number of extension workers in the four years specified, the level is still very low. One development agent served about 3813 agricultural households in 1996 and this number has been lowered to 1462 agricultural households in the year 1999. This is a clear indicator of the workload of the development agents. The proportion of households involved in the program has not exceeded 8 percent. This is also a good indicator of the inadequacy of the efforts that have been exerted in this useful program.

It is known that the contribution of the food crop extension program to food security from the viewpoint of the high increase in yield of major crops is significant. However, since the service is rendered to a very few agricultural households in the district, its impact on the general food security is low. On the other hand, the inputs used in the program are costly for most of the resource poor households. In addition to this, limitation of the extension services only to two food crop types (maize and sorghum) is another problem of the service in the district. These conditions together with the prevailing erratic rainfall and recurrent drought in the district, the program intervention has been insignificant.

The other extension program underway in the district is the natural resource management and development program. The area covered by natural resource management extension program increased from 0.4 percent in 1997 to 1.2 percent of the total area of the district in 1999. The proportion of agricultural households involved in this program increased from 1.4 percent in 1997 to 5.3 percent in 1999. This was in fact very low level of performance of the program.

Other necessary services such as potable water supply, communication and transportation network and others are either non-existent or inadequate. The length of all- weather roads is only 16 kilometers. In the district the sources of potable water are very few and the problem is aggravated during the dry season. There are no electricity and telephone

services in the whole district. All these factors indicate that the problems associated with social services are numerous.

4. Malnutrition, epidemic diseases and mortality

The issues under this topic are closely interrelated. Malnutrition creates favorable atmosphere for epidemic diseases and the latter can also cause malnutrition. Mortality is often the outcome of the interaction between malnutrition and epidemics. Levels and trend analysis of these interrelated topics will be presented as follows.

4.1 Malnutrition

In this study the analysis of malnutrition focuses on the nutritional status of children and women. Three separate but related indicators measure the nutritional status of children. These are proportion stunted, proportion wasted and proportion underweight. These three indices are expressed in standard deviation units (z-scores) from the median for a reference population. In all the three indicators, children whose standardized scores fall below minus two (- 2) standard deviations from the reference median are considered to be undernourished. Those whose similar scores fall below minus three (-3) standard deviations from the reference median are considered to be severely undernourished.

Stunting, which is the height-for-age index, measures linear growth retardation among children. Proportion stunted is an indicator of chronic undernourishment that is associated with inadequate food consumption resulting from poor feeding practices or lack of sufficient food.

Wasting, which is the index of weight for height, measures body mass in relation to body length. Proportion wasted is an indicator of the prevalence of acute undernourishment. This condition is associated with failure to receive adequate nutrition in the period immediately before measurement and it can also be the result of seasonal variations in food supply or recent episodes of illnesses. Weight, which is the weight-for-age index is a composite measure which takes into account both chronic and acute undernourishment.

In this study, children aged 3-36 months were measured and the results indicated that 47 percent of them were stunted, 18 percent of them were wasted, and 47 percent of them were underweight. Efforts were made to identify those children who were undernourished on the bases of some explanatory variables.

The final analysis shows that children from food insecure households, whose household heads are illiterate, female children, those from households of large family sizes, those whose mothers are currently out of wedlock, those whose mothers are undernourished, and those whose households experienced epidemic diseases in the previous 5 years were more undernourished compared to those from food secure households, from households headed by literate heads, male children, from small sized families, whose mothers are currently married, whose mothers are not undernourished, and those whose households did not experience epidemic diseases in the previous 5 years.

As mentioned earlier the other element in the analysis of malnutrition is the nutritional status of women. This is measured by taking the middle-upper-arm circumference of women aged 15 – 49 years. These women were then categorized into severely undernourished and not severely undernourished in one scenario. In another scenario,

they were divided into undernourished and not undernourished depending on their score on the measurement scale.

The results indicate that 19 percent of all the women in the sample area were severely undernourished. Breakdown by age shows that the older women (45 – 49) were the groups with the largest proportion of severely undernourished women. Midland women were in the worst of nutritional condition compared to their lowland counterparts.

In the second scenario, it was found out that 42 percent of all women in the sample area were undernourished. Lowland women were the most affected by undernourishment in this scenario. Similar to the first scenario, differentials by five-year age groups shows that the older women were the groups with the largest proportion of undernourished women. In both scenarios, the relationship between ages of women and their nutritional status assumes, in general terms, a U-shaped pattern.

Among the other variables that explain differentials in nutritional status of women, number of children ever- born, food security, and literacy status are those with the strongest explanatory power and with statistically highly significant relationship with the dependent variable. As the number of children ever born increases, proportion undernourished increases. Food secure households have much less number of undernourished women than food insecure households. Literate women have much less chance of being undernourished than illiterate women.

4.2 Epidemic diseases

The most common diseases in both midland and lowland areas of the district are tuberculosis/pneumonia, diarrhea and malaria. Tuberculosis/Pneumonia dominated the report of district health office and ranked first and second in 1997 and 1999, respectively, in the list of the top ten diseases. Similarly, diarrhea ranked second and first in the mentioned years respectively, while malaria ranked third in both years. According to the household survey, agro-ecologically, the prevalence of epidemic diseases is three times as high in lowland areas as in midland areas.

Table 3 Indicators of malnutrition, illness and morality, Fadis district, 2000

| <i>Topics and Indicators</i> | | <i>Current levels by AEZ</i> | | <i>District total</i> |
|--|-------------------|------------------------------|----------------|-----------------------|
| | | <i>Midland</i> | <i>Lowland</i> | |
| <i>1. Child malnutrition in percent</i> | | | | |
| <i>1.1 Stunted</i> | | 43.8 | 49.6 | 47.5 |
| <i>1.2 Severely stunted</i> | | 25.0 | 31.4 | 29.1 |
| <i>1.3 Wasted</i> | | 28.9 | 12.4 | 18.3 |
| <i>1.4 Severely wasted</i> | | 2.3 | 4.4 | 3.7 |
| <i>2. Women's nutrition in percent</i> | | | | |
| <i>2.1 Thin</i> | | 44.6 | 40.2 | 41.6 |
| <i>2.2 Very thin</i> | | 22.9 | 17.3 | 19.1 |
| <i>3. General mortality measures</i> | | | | |
| <i>3.1 Under five mortality per 1000</i> | <i>Males</i> | 262.66 | 350.66 | 316.3 |
| | <i>Females</i> | 266.33 | 311 | 302.6 |
| | <i>Both sexes</i> | 265.66 | 331.66 | 308.3 |

| <i>Topics and Indicators</i> | | <i>Current levels by AEZ</i> | | <i>District total</i> |
|--|-------------------|------------------------------|----------------|-----------------------|
| | | <i>Midland</i> | <i>Lowland</i> | |
| 3.2 <i>Life expectancy at birth</i> | <i>Males</i> | 40.97 | 33.1 | 35.8 |
| | <i>Females</i> | 41.07 | 37.4 | 37.6 |
| | <i>Both sexes</i> | 40.77 | 35.07 | 36.7 |
| 4. <i>Diseases (percent reported)</i> | <i>Pneumonia</i> | 59.69 | 38.89 | 44.66 |
| | <i>Anemia</i> | 3.8 | 24.33 | 18.64 |
| | <i>Malaria</i> | 16.73 | 9.98 | 11.85 |
| 4.2. <i>% Women sick last 2 wks</i> | | 55 | 54.7 | 54.8 |
| 4.3. <i>% Young children sick last 2 weeks</i> | | 54.7 | 50.8 | 52.2 |
| 3. <i>Specific mortality measures by sex</i> | | <i>Sex</i> | | |
| | | <i>Males</i> | <i>Females</i> | <i>Both sexes</i> |
| 3.1 <i>Infant mortality per 1000</i> | | 218.33 | 196.66 | 207.0 |
| 3.2 <i>Child mortality per 1000</i> | | 125.66 | 132.33 | 128.3 |
| 3.3 <i>Under-five mortality (CSA, 1994)</i> | | 161 | 184 | 172.5 |
| 3.4 <i>Life expectancy (CSA, 1994)</i> | | 51.8 | 49.4 | 50.6 |

4.3 Mortality

Mortality is one of the major components of population change. It is measured by various indicators. The basic measures include crude and age-specific death rates, infant and child mortality rates, and probabilities of dying at certain ages (including expectation of life at birth). The most common feature of these indices is that their computation involves relating the deaths in periods of time among particular categories of persons to the total numbers at risk in these categories in the same period of time.

In the present study, emphasis is given to under-five mortality. The reason for this is the fact that infant and child mortality rates are better indicators of the standards of life than any other measures of mortality. For the computation of under-five mortality rates data on children ever-born, surviving and dead were gathered from women aged 15-49 years. These data were then utilized to provide estimates of infant, child, and under five mortality rates and expectation of life at birth.

The estimates of infant, child and under-five mortality rates in the district made from the household survey in 2000 were much higher than those made by the Central Statistical Authority (CSA) for Oromiya region and East Hararge Zone in 1994. The expectation was that mortality would decrease in the years that followed the 1994 National Population and Housing Census. The infant and under-five mortality rates in 1994 were 117 and 171 for East Hararge Zone and 121 and 177 for Oromiya, respectively. The SERA Project survey conducted in the district in February 2000 revealed that these estimates were as high as 207 and 308, respectively. These estimates mean that 207 infants die from among 1000 live births before celebrating their first birthday and 308 children die among 1000 children before celebrating their fifth birth date. These estimates may appear overestimates from the point of view of demographic developments in the last few decades. But death reports were rarely over reported. Mothers usually underreport deaths of their children. Thus, these estimates reflect the true situation in the

district particularly when the severe drought and famine incidences in the last 10 years were taken into consideration.

Another analysis of mortality focused on deaths in the 5 years prior to the survey. Children who were alive and those who died in those 5 years were compared in terms of some prenatal and postnatal variables. With some surprise, all the children who were reported to have died belonged to mothers who did not take TT2 injection, who gave birth at home, and those whose births were assisted by untrained assistants. With some room for chance fluctuations in sampling, this point reveals the importance of these variables in determining the survival chance of children.

Among the postnatal variables, health status of the child at birth, birth weight, vaccination and treatment in times of sickness were cross-tabulated with survival status of children. The results indicate that comparatively less number of children died among those who were strong or healthy at birth, big in size, vaccinated against the major child diseases and those who were taken to or treated in health facilities when fell sick.

5. Food insecurity and poverty

Food security is a very critical issue facing East Hararge Zone in general and the district of Fadis in particular. Debebe Habte-wold and S. Maxwell (1992) define the term food security or insecurity as follows: “Food security refers to the access by all people at all times to enough food for an active and healthy life. Food insecurity exists when members of a household have an inadequate diet for part or all of the year or face the possibility of an inadequate diet in the future.” Food insecurity is usually divided into chronic and transitory food insecurity. Chronic food insecurity implies inaccessibility to food for a relatively long period of time while transitory food insecurity implies seasonal inaccessibility to food.

All available data reveal that the people of Fadis district have been food insecure for at least the last 30 years. The data obtained from the district agricultural office indicate that 32 percent of the population was food insecure in 1997. This proportion rose to 48 percent in 1998 and shot up to 94 percent in 1999. This undoubtedly shows that food problems in the district are very serious and is increasing at an alarming rate. The proportion of the population that had received food aid rose from 10 percent in 1997 to 74 percent in 1999.

In the SERA project survey conducted in February 2000 a question on food stock status was posed to the respondents. Distribution of their responses indicated that 49.1 percent responded that their food stock was empty; 50.7 percent responded that what they had in stock at the time of the survey (February) would not be sufficient until the next harvest. Only 0.2 percent responded that they had sufficient food in stock until the next harvest. Specifically, of those who replied that they had sufficient food in stock, 20 percent had enough for one more month, 51.5 percent had enough for two more months, and 28.5 percent had enough for more than two more months.

In another analysis, food production for four years (1997 – 2000) was averaged and per capita food availability for a year was observed. The result indicated that 70.4 percent had enough per capita food available for three months or less, 16.6 percent had enough per capita food available for six months or less, 7.6 percent had enough per capita food

available for more than six months and less or equal to nine months time, and the remaining 5.4 percent had enough per capita food available for more than nine months.

The food availability scenario was followed in analyzing the variables that explain differentials among households in the number of months in a year for which food is available. The analysis employed both the bivariate and multivariate levels of analysis. The results of both analyses consistently show that those households headed by males, by literate heads, and by younger heads have enough food for their members for many more months than those headed by females, illiterates and older heads. Family size is negatively associated with number of months for which food is available. Land holding size is positively associated with food availability. Those households that own domestic animals, oxen in particular, have food available for many more months than those who do not own domestic animals. Similarly, those who own farm tools, practice crop rotation, plant trees, received credit to improve crop or livestock productivity, and received assistance or advice to prevent soil erosion have enough food to live on for more number of months than those who lack farm tools, do not practice crop rotation, do not plant tree, did not receive credit and assistance or advice to prevent soil erosion. Finally, lowland households are found to have more chance of being food insecure compared to midland households.

All the above figures reveal the chronic and transitory food insecurity status of the district. This situation is the outcome of many interrelated factors. First agricultural production has been very low because of a number of causes. One most important element in this web of causes is rainfall. There has been erratic and inadequate rainfall in the district. In addition, the geographic setting of the district is such that the bulk of the district lies in lowland agro-climatic zone and, as a result, receives little or no rainfall. Even the rainwater that falls on the midland areas is drained into Gobelle and Erer river valleys. These river valleys lie to the western and eastern extremes of the district and are far away from the majority of the people of the district. These valleys are not suitable for traditional irrigation.

Another element among the causes for low agricultural productivity is the low level of technology. One peculiar aspect of farming in the district is that a significant proportion of the households till their farm plot by hand. One can easily imagine the amount of yields the hand tillers will be able to harvest from their plots. Another insignificant proportion of the households uses oxen for farming, which is also part of the rudimentary traditional agriculture. Another aspect of the low level of agricultural technology is the recent introduction and low level of agricultural extension programs. It was mentioned in another section of this chapter that the proportion of agricultural households that are involved in food crop extension programs is below 8 percent. The ratio of development agents to agricultural households involved in the programs is 1 to 173.

Table 4 Indicators of food insecurity and poverty, Fadis district, 2000

| <i>Topics and Indicators</i> | <i>Current levels by AEZ</i> | | <i>District total</i> |
|---|------------------------------|----------------|-----------------------|
| | <i>Midland</i> | <i>Lowland</i> | |
| <i>1. Land holding</i> | | | |
| <i>1.1 % Landless</i> | 1.5 | 1.2 | 1.31 |
| <i>1.2 Average crop land cultivated per HH (in ha)</i> | 0.39 | 0.47 | 0.44 |
| <i>1.3 Percent owned very small land (<= 0.25 ha)</i> | 24.1 | 8.9 | 13.95 |
| <i>1.4 % with 2 or more plots</i> | 22.5 | 31.4 | 28.5 |
| <i>2. Animal ownership</i> | | | |
| <i>2.1 % Ox less</i> | 90.6 | 96.1 | 94.3 |
| <i>2.2 % HHs own one ox</i> | 8.4 | 3.7 | 5.3 |
| <i>2.3 TLU per capita</i> | 0.25 | 0.19 | 0.21 |
| <i>2.4 TLU per HH</i> | 1.19 | 0.96 | 1.04 |
| <i>3.1 % Ranked very poor</i> | 40 | 15 | 23.3 |
| <i>3.2 % < 600 Birr/HH</i> | 42.9 | 65.8 | 58.1 |
| <i>3.4 % < 1200 Birr/HH</i> | 74.9 | 84.7 | 81.4 |
| <i>4. Income and poverty</i> | | | |
| <i>4.1 % Income sufficient 3 months or less</i> | 12.8 | 44.1 | 33.7 |
| <i>4.2 % Much too small to make ends meet</i> | 41.9 | 72.1 | 62.1 |
| <i>4.3 % Poverty "faced" in last 5 years</i> | 95.1 | 90.4 | 92 |
| <i>4.4 Mean per capita (KGs) /year 2000/</i> | 64.1 | 15.2 | 31.5 |
| <i>6. Food Insecurity</i> | | | |
| <i>6.1 % Current food stock under 3 months</i> | 74.4 | 91.1 | 85.6 |
| <i>6.2% Chronic food insecurity perceived last 10 yrs</i> | 99.5 | 99.3 | 99.3 |
| <i>7. % FA within 3 hrs walking to weekly market</i> | 100 | 50 | 66.6 |
| | <i>Years</i> | | |
| <i>8. Trend over time</i> | 1996 | 1997 | 1998 |
| <i>8.1 Mean per capita food production</i> | 114 | 88 | 10 |
| <i>8.2 TLU per capita</i> | 0.51 | 0.47 | 0.27 |
| <i>8.3 TLU per household</i> | 2.30 | 2.26 | 1.36 |

Land holding size is also another essential element in agricultural production. About 14 percent of all the households covered by the survey reported that their individual land holding size is less than or equal to 0.25 hectare. Agricultural density has been increasing. Grazing land has been shrinking. Arable land is limited by nature. Its size relative to population size is decreasing fast. These figures indicate the ever-increasing pressure on land and, thus, the negative impact on agricultural production. Another factor among the determinants of agricultural production is crop loss due to a number of causes. Both pre-harvest and post-harvest factors contribute to crop losses.

As mentioned earlier, food insecurity is the result not only of low agricultural productivity. If people have other sources of income or accumulated wealth, they can change the wealth in to cash and purchase food from the market. In the district of Fadis, however, the recurrent drought of the last few decades has led to wealth depletion and the majority of the households have little or no wealth. Even those who can be said to have

some wealth had it in the form of livestock. At the time of the survey 27.6 percent of the households did not own any kind of livestock at all. About 26 percent had the equivalent of one or less in tropical livestock unit. Another 27 percent had 1-2 in the same unit. Livestock ownership in tropical livestock unit was 0.21 per capita and 1.04 per household.

Livestock ownership was changed to cash equivalents and the result indicated that 54.4 percent of the households could earn less than 500 Birr if they were to sell what they owned. With an average family size of 5.1 persons per household, so many households would have less than 100 Birr for each of their members. Another 26.3 percent earns 500-1000 Birr. This shows that 80.7 percent of the households lie in the livestock wealth category of less or equal to 1000 Birr.

Another element in food security is income. Major sources of income include crop and livestock sale, payment for various off-farm and non-farm activities, and remittance. It appears that there are few sources of income. Results of the household survey indicate that 76 percent of the households surveyed earned no income at all, 5 percent earned less than 100 Birr, and 8 percent earned between 100 and 200 Birr from crop sale, off-farm or non-farm activities. The households reported no other sources of income.

In summary, all the statements in the above paragraphs show that the people of the district are highly food insecure because of very low yield in agricultural production, lack of wealth and absence of income generating activities.

6. Disaster history and institutional responses

The combined effects of prolonged rainfall scarcity and its erratic nature, environmental degradation, recurrent drought, famine and epidemics have a long history in Fadis District. Data obtained from zonal DPPD revealed that the occurrence of drought had been every 10 years between 1974 and 1994. Then, it occurred after 5 years in 1999. Since 1999, it became a yearly occurrence. In recent years vulnerability induced by drought in the district is increasing with its high magnitude of negative impact. Quite a considerable part of the population has been dependent on external food aid for survival. The number of needy population was 50708 in 1997, 77898 in 1998 and 158374 in 1999. Out of those needy population 5327 (10 %), 35536 (45 %) and 117136 (74 %) received food aid in 1997, 1998 and 1999 respectively.

According to the perception of community elders assessed through rapid rural appraisal methods, vulnerability to famine has increased through time because of the variability and erratic nature of rainfall in all agro-ecological zones, decrease in agricultural output, loss of livestock due to diseases and prolonged drought, decrease in per capita land holding, and depletion of household assets.

Table 5 Indicators of disaster history, Fadis district, 2000

| <i>Topics and Indicators</i> | <i>Years</i> | | | |
|------------------------------|------------------|------------------|-------------------|--------------|
| | <i>1974-1994</i> | <i>1994-1999</i> | <i>Since 1999</i> | <i>total</i> |
| <i>1. Drought risk</i> | | | | |

| <i>Topics and Indicators</i> | <i>Years</i> | | | |
|---|---|------------------|------------------|----------|
| | <i>1.1 Average number of years between droughts</i> | <i>10</i> | <i>5</i> | <i>1</i> |
| <i>1.2 % Expected disasters in the future</i> | <i>-</i> | <i>-</i> | <i>94.4</i> | |
| <i>1.3 Rainfall in MM</i> | <i>1995</i> | <i>1998</i> | <i>1999</i> | |
| | <i>783.7</i> | <i>458.2</i> | <i>596.5</i> | |
| <i>2. Epidemic frequency</i> | <i>Before 1974</i> | <i>1974-1991</i> | 1991-1999 | |
| <i>2.1 Average number of years between severe human epidemics</i> | <i>10</i> | <i>8</i> | <i>5.5</i> | |
| <i>3. Disaster prevention</i> | <i>1996</i> | <i>1997</i> | <i>1998</i> | |
| <i>3.1 % aided with food from needy pop</i> | <i>10</i> | <i>45</i> | <i>74</i> | |
| <i>4. Types of epidemics</i> | <i>Current levels by AEZ</i> | | | |
| | <i>Midland</i> | <i>Lowland</i> | | |
| <i>4.1 % HHs with epidemics in last 5 yrs</i> | <i>80.8</i> | <i>91.4</i> | <i>87.8</i> | |
| <i>4.1.1 Percent reported diarrhea</i> | <i>86.0</i> | <i>68.8</i> | <i>74.1</i> | |
| <i>4.1.2 Percent reported malaria</i> | <i>31.1</i> | <i>82.5</i> | <i>66.8</i> | |
| <i>4.1.3 Percent reported typhus/fever</i> | <i>72.0</i> | <i>62.6</i> | <i>65.5</i> | |
| <i>4.1.4 Percent reported measles</i> | <i>55.5</i> | <i>44.6</i> | <i>47.9</i> | |
| <i>5. % HHs Participated in EGS/FFW</i> | <i>100</i> | <i>100</i> | <i>100</i> | |

The three most important perceived causes of epidemic diseases include shortage of safe drinking water, problem of personal hygiene and environmental sanitation, and inadequacy of health facilities. Generally, households with less awareness about environmental sanitation and personal hygiene, households who have less access to safe drinking water and households with low nutritional status are more vulnerable to epidemic diseases.

Institutional responses can be direct and indirect in combating disaster in the long run. The direct and purposive institutional responses to disaster and the assistance rendered to the disaster prone population in the area were limited in their scope and mainly focused on delivery of food aid by both governmental and non-governmental organizations. But there were a number of development activities that were undertaken by both government and NGOs in the area of agricultural production including extension program, natural resource conservation and strengthening rural institutions. In general, these activities were not sufficient to mitigate disaster and recurrent famine in the district.

7. Resilience, coping strategies and local capacities

From the long history of disaster in the area and frequency and intensity of disaster of one or more types, people in this disaster prone area would develop different types of coping strategies or ways of responding to the stressful situations. The number and variety of coping and mitigation strategies mainly depend on the stock of food and income and consumption habit, asset and wealth possession as well as the frequency and intensity or severity of the problem itself.

Timing of the coping strategies appears to have been made parallel to the logical sequence of events and whether the strategies are reversible or irreversible depends on

income and stock of food as well as severity of the disaster itself. Strategies that are related to change in consumption patterns, sale of fire wood, borrowing food, grain or cash are known as reversible and strategies that involved sale of productive assets and household effects, withdrawal of children from school and out migration are irreversible strategies as the effects they bring about are rarely reversed.

Reducing number of meals was frequently used by about 76 percent of the surveyed households in the 12 months prior to the survey and almost no household was reported to have never used this strategy in the last ten years prior to the survey.

Table 6 Percent distribution of households by use of reversible and irreversible coping strategies in the previous 10 years, Fadis district, 2000

| <i>Type of strategy</i> | <i>Frequency of use</i> | <i>Agro ecological zones</i> | | <i>District total</i> |
|-------------------------|-------------------------|------------------------------|-----------------|-----------------------|
| | | <i>Mid land</i> | <i>Low land</i> | |
| <i>Irreversible</i> | <i>Frequently</i> | 15.4 | 21.1 | 19.1 |
| | <i>Sometimes</i> | 25 | 19.4 | 21.3 |
| | <i>Never used</i> | 59.6 | 59.6 | 59.6 |
| <i>Reversible</i> | <i>Frequently</i> | 29.9 | 35.5 | 33.6 |
| | <i>Sometimes</i> | 42 | 28.1 | 32.8 |
| | <i>Never used</i> | 28.1 | 36.5 | 33.6 |

Generally about 34 percent of the households used the reversible coping strategies frequently and about 34 percent never used these strategies in the last ten years prior to the survey. On the contrary, the irreversible strategies, which consist sale of household utilities, withdrawal of children from school and migration were frequently used by 19 percent of the households. In general, when the households were asked whether or not they used these coping strategies within the last twelve months prior to the survey, they responded that they used almost all and relatively small number of households used migration. The main reason behind this is that migration needs awareness or information on where and when to migrate in order to be used as a coping strategy.

B. CONCLUSIONS

The relationship between population, natural resources and environment is such that as population size increases natural resources are overexploited, land holding is fragmented, living trees are cut down for fuel and construction purposes, fallow periods are shortened, croplands are over ploughed, grasslands are overgrazed. Chopping down of trees will result in deforestation, which will in turn contribute to the unfavorable changes in climatic conditions. The bottom line of all these processes is that there will be severe stress on the environment. In the district of Fadis there has been severe stress on the natural environment. But it is difficult to attribute all the stresses on the environment to population growth and the negative human activities that follow. Thus, it can be concluded that shortage of rain or drought has been the most important factor among those that contributed to degradation of the environment.

Access to basic socioeconomic services is very low in the district of Fadis. The provision of educational services is so low that only 4 percent of the population aged 10 years and

above can read and write at the present time. The corresponding figures for Oromiya and East Hararge were 22.4 and 12.2 percent, respectively, in 1999. Gross enrollment ratio is also very low. Only 22 percent of boys and 10 percent of girls in the primary school age population were enrolled in primary schools in 1999. The situation is even worse when retention ratios are considered. Only 35 percent of boys and 23 percent of girls who were enrolled in grade 1 in 1996 completed grade 4 in 1999.

The provision of health services is similarly low. There is no change in the number of health institutions while the number of health personnel who work in these institutions has been decreasing from time to time. This has resulted in a very low level of preventive health services. The proportion of pregnant women with at least two doses of TT2 never exceeded 25 percent. Child immunization, except against polio, which is carried out in large scale campaigns, is very low. Agricultural extension services were started very recently and are provided to less than 8 percent of the households. Other necessary services such as potable water supply, communication and transportation networks, and similar others are either non-existent or far from adequate.

Available data show that the people of Fadis have been food insecure for at least the last 3 decades. The degree of both chronic and transitory food insecurity has been increasing rapidly. This has been the result of many interrelated causal factors. First and foremost, agricultural productivity has been very low because of inadequate rainfall, backward agricultural technology, soil infertility and other related factors. Second, the usually fragile wealth of the people has been depleted over the years leaving the people without anything to sell for the purchases of food. Thirdly, there are few sources of off-farm or non-farm income.

One of the outcomes of these situations is malnutrition, particularly that of children and their mothers. This study has shown a level of malnutrition of women and children that is unusually very high. 47 percent of children aged 3-36 months are stunted and 42 percent of women aged 15-49 years are undernourished. Epidemic diseases are rampant. Tuberculosis, diarrhea and malaria are the first three in the list of the top ten diseases. Malnutrition and epidemic diseases appear to have joined arms to increase the level of mortality to very high levels. Infant and under five mortality rates were as high as 207 and 308, respectively, in 2000.

In general, this research exercise has shown to a large extent that the district of Fadis has been repeatedly affected by recurrent drought in the last 3 decades. This has been followed by chronic food insecurity, severe malnutrition, an increase in the prevalence and incidence of epidemic diseases, and high mortality rates, particularly for infants and children. The environment has become so hostile and squalid to be habitable. The life of the people has been deteriorating and reached a level where the majority of the households live in houses so empty that a visitor will have the impression that the household is ready to move away. Their wealth has been seriously depleted that they have little or nothing in the form of wealth or any other asset. They have few or no sources of income.

This grim reality makes the usual recommendations for improving the different sectors impractical. It is like suggesting this or that kind of comb for a bald person. Whatever it takes, a lot of effort has to be made to bring the life of these people back to an acceptable

standard. Otherwise, the vicious circle of poverty will continue and any effort of development will be unsuccessful. The people will consume all of what is given to them in the form of credit or loan. The very essence of credit is that the person works with the money lent to him, improves his life with the profits from it and pays the credit back to the creditor. This is not the case with a person who has nothing to eat and to whom the difference between credit and assistance is blurred. That is why the person has to be brought back to where he/she can take credit as credit and can be able to make the back payment. All these require rehabilitation of the people in every aspect. This in turn needs a lot of resources that, however, are not impossible to pull together.