THE TRANSITIONAL GOVERNMENT OF ETHIOPIA
CENTRAL STATISTICAL AUTHORITY

REPORT ON THE NATIONAL RURAL NUTRITION SURVEY, CORE MODULE.

MARCH 1992

NATIONAL NUTRITIONAL SURVEILLANCE SYSTEM

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NATIONAL NUTRITIONAL SURVEILLANCE SYSTEM

ADDIS ABABA
MAY 1993

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PREFACE

1- Background

A convenient way of introducing nutritional surveillance to the average reader would be to cite the definition given by a joint FAO/UNICEF/WHO Expert Committee as follows: "nutritional surveillance means to watch over nutrition, in order to make decisions which will lead to improvements in the nutrition of the population." In general the uses of nutrition surveillance activities are for health and development planning, for program management and evaluation and for timely warning and intervention.

The term "nutrition surveillance" first found wide attention and increasing application following the World Food Conference in 1974 and programs began to be established in developing countries from about 1976 onward. Concern over short-run and long-run consequences of hunger and malnutrition mobilized international development agencies and many national governments to devote new attention and resources to improve the nutritional status of their populations. Research in this relatively new concept began to be carried on in both rich and poor countries. Soon, in poor countries like Bangladesh, the Philippines, Mexico and Senegal developed plans and interventions designed by nutritional scientists based on modern understanding of human nutrient requirements. Experiences from these programs provided the foundations for nutrition surveillance systems that we are talking about today.

The above ideas, concerns and procedures have been generally followed in Ethiopia. Firstly a children's nutrition unit (CNU) was established in 1962 which with some time lag, later developed to become the Ethiopia Nutrition Institute (ENI) in 1968 under the Ministry of Health. ENI was then the principal government agency responsible for coordinating and carrying out nutritional studies and for tailoring specific nutritional intervention measures. As bases for its activities ENI had to collect, process and analyse some nutrition and related data on small scale bases in various localities. Later on after the mid 1970's the unit of the newly established RRC which eventually has come to be known as the Early Warning and Planning Services made food and nutrition data generation one of its major activities. It needed such data on which to

base RRC's food relief and rehabilitation activities and it collected climatological data for most of the country and more data on crops and livestock for areas with food shortage and nutritional problems compiling and analysing them at short intervals of time. The result has been the generation of substantial data that have been used not only by the RRC and nongovernmental organizations for relief and rehabilitation but have also had some use in development planning and related activities.

Recurrent and prepetual food shortages and nutrition problems necessitated permanent monitoring, relief activities and short and long term planning and implementation activities to improve the situation leading eventually to food self-sufficiency. And all this created acute need for more reliable, valid and detailed food and nutrition data on as continuous basis as possible. Then the Central Statistical Authority also became involved, undertaking three rounds of a large scale Rural Nutrition Survey in 1982/83 and a Nutrition and Health Survey of Resettlement Areas in 1988.

Information from the above surveys and related sources as well as experiences of other developing countries in the area have led to the present consensus of conceiving food and nutrition problems as complex and multi-sectoral in nature and that it would be hardly feaisible, if not impossible, to have nutritional problems solved by a single sector. This gave rise to the need and establishment of a nutrition surveillance system of multi-sectoral nature.

2 - Inception and Establishment of a National Nutritional Surveillance System in Ethiopia

Thus, largely as a result of the above conceptualizing and understanding of the porblem as complex, with ENI initiative, a national workshop on nutritional surveillance co-sponsored by WHO and UNICEF was conducted in May 1989 with the objective of exploring the feasibility of establishing a sustainable national nutritional surveillance system (NNSS) in the country. Participating agencies in the workshop were the Ministry of Economic Development and Planning (MOPED, ONCCP at the time), Ministry of Health (MOH), Ministry of Agriculture (MOA), the Ethiopian Nutrition Institute (ENI), Relief and Rehabilitation Commission (RRC), Central Statistical Authority (CSA) and many concerned nongovernmental organizations. A major outcome of the workshop was a proposal for the formation of a National Technical Committee (NTC)

to plan and develcp a workplan with a feasible time schedule of activities whose implementations it would coordinate. The NTC was soon established in October 1989, with membership drawn from MOPED, ENI, RRC and CSA just as envisaged in the workshop.

Soon the NTC started work with developing working documents describing the overall tasks and processes of the NNSS and duties and roles of participating agencies. The main working document produced was a proposal entitled "National Nutritional Surveillance System in Ethiopia, Project Proposal (1990 - 1994), January 29 1990", which was later revised by 15 January 1991, by a team of four trainees (for the project) with the assistance of Cornell University. The NNSS was designed to provide information to the members of the NTC, line Ministries and the Council of Ministers in general and thus help government's development programs by explicitly considering nutrition among the objectives for planning along side economic, technical, environmental, etc. goals. According to the scheme of the proposal CSA would be responsible for undertaking large scale national surveys such as the core module and produce basic analytical reports; while ENI's role would largely consist of carrying out required indepth studies and surveys and coordinating more technical issues. As soon as the proposal was accepted by the government and supporting agencies, work proceeded on the first task of undertaking a large national basic nutrition survey and henceforth the focus of activities shifted to the CSA.

As the overall objective of NNSS included strengthening of institutional capacity of participating agencies, inter alia, four professional employees (one each from CSA, ENI, RRC and MOPED) with anticipated key technical roles in the NNSS were soon given a short term training at Cornell University with emphasis on quantitative aspects of nutrition even before the start of the survey undertaking, as part of the manpower training component of the project. Depending on the degree of their project requirements, these institutions were also provided with personal computers, four wheel drive cars, stationery and related equipment and supplies.

3- Undertaking Rural Nutrition Survey

As a first major task under the NNSS, a national nutrition survey termed here as a Core Module, Rural Nutrition Survey was undertaken by CSA in March-April 1992. This report presents the results from this survey with indication of salient implications and recommendations for follow-on activities. In this report main results

are given at the national and regional levels disaggregating for selected socioeconomic groups. As a basic analysis, this report limits itself to highlighting major findings and providing the more obvious implications and suggestions for action and for further studies and investigations.

The successful conclusion of the Rural Nutrition Survey with the publication of this report would have been unthinkable without the uninterrupted active moral and material support by donar agencies namely: FAO,WHO and especially UNICEF which not only participated actively in the NTC meetings but also financed the many foreign and local training, logistical and other activities and managed the procurement of needed equipment and supplies from abroad and local suppliers. Of course it gives great pleasure to CSA to express its appreciations to UNICE, WHO and FAO which pooled resources under the Inter-Agency Food and Nutrition Surveillance Program (IFNS) and supported the survey undertaking under the NNSS.

Many thanks should certainly also go to Cornell University Food and Nutrition Program and especially to its internationally known nutrition specialist Dr.David Pelletier who has from the beginning served as the principal advisor, assisting in revising the proposal for the NNSS, was behind the development of the survey questionnaire and was largely responsible for determining the contents and analytyical methods of the basic report and for most of its actual analysis and writing. Perhaps one aspect of the measure of Dr.Pelletier's commitment to the project could be seen from the fact that he brought a very powerful and fast portable laptop personal computer which facilitated and speeded up the overall data processing significantly thus enabling completion of this basic analytical report writing within a very short time.

Finally the coordinating role of the NTC of the NNSS is worth praise as it performed commendably under difficult times planning activities, setting time tables and revising them and making difficult decisions in successful efforts of pulling resources together from diverse sources to push the survey undertaking to its successful conclusion.

Acronyms

1 - CSA = Central Statistical Authority
2 - CASP = CDC (i.e. Center for Disease Control) Anthropometric Software Package
3 - ENI = Ethiopian Nutrition Institute
4 - EWS = Early Warning Service
5 - FA = Farmers' Association
6 - FAO = Food and Agricultural Organization (of the United Nation)
7 - FIS = Food Information System
8 - HA = Heght for Age
9 - HAZ = Height for Age Z-Score
10 - IFNS = Inter-Agency Food and Nutrition Surveillace Program
11 - MOPED= Ministry of Planning and Economic Development
12 - NNSS = National Nutrition Surveillance System
13 - NTCNS= National Technical Committee on Nutrition Surveillance
14 - PEM = Protein - Energy Malnutrition
15 - Prob = Implied probability by Chi-Square Mantel-Haenszel test for linear association
16 - PSU = Primary Sampling Unit
17 - RAP = Rapid Assessment Program
18 - RRC = Relief & Rehabilitation Commission
19 - S.D = Standard Deviation
20 - UNICEF= United Nations Children's Fund
21 - WA = Weight foe Age
22 - WAZ = Weight for Age Z-Score
23 - WH = Weight for Height
24 - WHO = World Health Organization
25 - WHZ = Weight for Height Z-Score

LIST OF TABLES

Coverage — Page

Table 1: Distribution of Awrajas and FA, in Covered Regions 22
Table 2: Distribution of FA's and Households covered by Region... 23

National and Regional Levels of Malnutrition

Table 3: Prevalence of Stunting, Wasting and Underweight by Age and Sex (Z-Scores) 100
Table 4: Prevalence of Stunting, Wasting and Underweight by Region (Z-Scores) 101
Table 5: Prevalence of Stunting by Region and Child's Age (Z-Scores) 102
Table 6: Prevalence of Wasting by REgion and Child's Age (Z-Scores) 103
Table 7: Change in Stunting 1983-92 by Region, (Z-Scores) 104
Table 8: Change in Wasting 1983-92 (Z-Scores)..... 105
Table 9: Change in Underweight between 1983-92 by Region(Z-Score) 106
Table 10: Change in Stunting and Wasting by Region, 1983-92, Differences in prevalence and Means 107

Distribution of Malnutrition Across Agro-Ecological and Socioeconomic Groups

Table 11: Prevalence of Stunting and Wasting by Altitude and Age.. 108
Table 12: Prevalence of Stunting and Wasting by FA level Agriculture Type 108
Table 13: Prevalence of Stunting by Region and Altitude..... 109
Table 14: Prevalence of Wasting by Regions and Altitude 110
Table 15: Prevalence of Stunting and Wasting by Agro-Ecological System and Child's Age Group..... 111
Table 16: Prevalence of Stunting and Wasting by Primary Source of Household Income and Child's Age 112
Table 17: Prevalence of Stunting by Economic Group 113
Table 18: Prevalence of Wasting by Economic Group..... 114
Table 19: Prevalence of Stunting and Wasting in selected Household Agricultural System, by Age group (in Months). 115
Table 20: Prevalence of Stunting and Wasting Among Cereal Growers by Cultivated Area and Region (Children 24-59 Months).... 116
Table 21: Prevalence of Stunting and Wasting by Mother's Ethnic Group 117
Table 22: Indicators of Caretaking Practices for Boys and Girls, by Mothers' Ethnic Group and Child's Age 118
Table 23: Indicators of Caretaking Practices for Boys and Girls, by Mothers' Religion 119

List of Tables (continued)

Page

Distribution of Related Indicators Across Regions and Economic Groups

Health-Related Indicators

Table 24: Prevalence (in percent) and Duration of Illness in Prior 14 days 120

Table 25: Type of Illness by Child's Age 120

Table 26: Prevalence (in percent) and Type of Illness in Prior 14 days, by Region 121

Table 27: Prevalence (in percent) and Type of Illness in Prior 14 days, by Primary Source of Household Income..... 122

Table 28: Primary Endemic Disease as perceived by Health Staff at Farmers Association Level, by Region 123

Table 29: Water Sources by Region 124

Table 30: Water Sources by Primary Source of Household Income,... 125

Indicators Related to Child Care and Feeding

Table 31: Percent of Children Still Breastfed at various Ages by Region 126

Table 32: Precent of Children Still Exclusively Breastfed at various Age by Region 127

Table 33: Percentage distribution of initiation of Breastfeeding by Region 128

Table 34: Type of First Foods/Liquids Given after Birth, by Region 129

Table 35: Percent of Children Still Breastfed at Various Ages by Source of Income 130

Table 36: Percent of Children Still Exclusively Breastfed, by age and source of Household Income 131

Table 37: Initiation of breastfeeding by Source of Household Income 132

Table 38: Type of First Food/Liquids Given after Birth, by Soruce of Household Income 133

Table 39: Distribution of Children by Types of Foods Eaten in Prior Months by Child's Age 134

Table 40: Percent of Children correctly Recognized as Wasted by their Mothers by Region and Age of Child 135

Table 41: Percent of Children correctly Recognized as Wasted by their Mothers, by Soruce of Household Income and Age of child 136

Indicators of the Situation of Women

Table 42: Indicators of the Situation of Mothers, by Region..... 137

Table 43: Indicators of the Situation of Women, by Soruce of Income 138

List of Figures

		Page
1.	Causes of Malnutrition and Young Child Deaths	5
2.	Illustration of the Sequencing of the NNSS Components	6
3.	Prevalence of stunting, wasting and underweight by age: both sexes	29
4.	Prevalence of stunting, wasting and underweight by age: boys	30
5.	Prevalence of stunting, wasting and underweight by age: girls	31
6.	Prevalence of stunting by region	33
7.	Prevalence of stunting by region and age (in months)	34
8.	Prevalence of wasting by region	35
9.	Map of Stunting by region	37
10.	Map of Wasting by region	38
11.	Map of Underweight by region	39
12.	Levels of stunting Jan/Feb.1983 to March 1992	40
13.	Changes in stunting Jan./Feb. 1983 to March 1992	41
14.	Changes in mean HAZ Jan./Feb. 1983 to March 1992	42
15.	Levels of wasting by region Jan./Feb. 1983 to March 1992	44
16.	Changes in mean WHZ Jan./Feb. 1983 to March 1992	45
17.	Changes in wasting Jan./Feb. 1983 to March 1992	46
18.	Levels of underweight During Jan./Feb. to March 1992	49
19.	Changes in underweight Jan./Feb. 1983 to March 1992	50
20.	Changes in mean WAZ Jan./Feb. 1983 to March 1992	51
21.	Prevalence of stunting and wasting by Primary source of household income	57
22.	Prevalence of stunting by source of household income and Age Group	58
23.	Prevalence of stunting and wasting by Primary source of household income (6 - 23 Months)	59
24.	Prevalence of stunting and wasting by primary source of household income (24-59 months)	60
25.	Prevalence of stunting and wasting by ethnic groups of mothers (6 - 23 Months)	63
26.	Prevalence of stunting and wasting by ethnic groups of mothers (24 - 59 Months)	64
27.	Relative risk of stunting by ethnic group of mothers (6-23 months)	65
28.	Percent ill in prior two weeks	67
29.	Percent with diarrhea in prior two weeks by region	68
30.	Households with pipe water supply by region	70
31.	Households by water supply and region	71
32.	Percent still breastfeeding by age (in Months)	72
33.	Duration of exclusive and supplemented breastfeeding (median) by region	74
34.	Children exclusively breastfed by age (in Months)	75
35.	Stunting and exclusive breastfeeding (regional level aggregation)	76
36.	Children initiating breastfeeding after 12 hours of birth	78
37.	First foods and liquids given after birth	79
38.	Distribution of Infants by Foods Eaten in prior month	80

List of Figures (continued)

Page

39. Percent of mothers recognizing wasting, by region..... 83

40. Mean Scores summarizing the situation of women by region 84

41. Mean Scores summarizing the situation of women by primary source of income 85

Haaga graphs

42. Distribution of Stunted Children by Region 94

43. Distribution of Wasted Children by Region 95

44. Distribution of Stunted Children by Primary Source of Household Income 96

45. Distribution of Wasted Children by Primary Source of Household Income 97

46. Distribution of Stunted Children by Economic Group and Size of Cultivated land 98

47. Distribution of Wasted Children by Economic Group and Size of Cultivated land 99

Appendix Tables — List of Appendix Tables — Page

1a: Prevalence of Low Height for Age (as percent of median classification) by Age and Sex 155

1b: Prevalence of Low Weight for Height (as percent of median classification) by Age and Sex 156

1c: Prevalence of Low Weight for Age (as a percent of median classification) by Age and Sex 157

2a: Centil Distribution of Height for Age of Children Aged 6-59 Months by Region 158

2b: Centile Distribution of Weight for Age of Children Aged 6-59 Months 159

2c: Centile Distribution of Weight for Age of Children Aged 6-59 Months by Region 160

3a: Prevalence of Low Height for Age by Age, Sex and Severity.... 161

3b: Prevalence of Low Weight for Height by Age, Sex and Severity. 162

3c: Prevalence of Low Weight for Age by Age, Sex and Severity.... 163

4a: Prevalence of Low Height of Age (by Percent of Median classification) by Region..... 164

4b: Prevalence of Low Weight for Height (as percent of median classification) by Region 165

4c: Prevalence of Low Weight for Age (as percent of Median classification) by Region 166

5: Prevalence of General Malnutrition (under weight) based on Z-Scores 167

6: Absolute Numbers of Children Stunted and Wasted, by Region, and Percent Distribution Across Regions 168

7: Absolute Numbers of Children Stunted and Wasted by primary source of Household Income and Percent Distribution Across source of Household Income 169

8: Absolute Numbers of Children Stunted and Wasted by Economic Group and Percent Distribution Across Economic Group..... 170

9: Actual Sample Sizes for Economic Groups..... 171

10: Actual Sample Sizes for Analysis of Child Care 172

11: Actual Sample Sizes for Analysis of Cereal Growers by Region and Cultivated Area 173

12: Distribution of Raised Number of Children by Age (in Months) and Sex in the 22 Region covered by the Survey 174

13: Total Number of Children (raised) by Sex, Broad Age Group (in Months) and Region 175

List of Appendix tables (continued)

Appendix Tables		Page
14:	Total number of Children (raised) by Sex, Broad Age group (in Months) and Main Source of Household Income	177
15:	Total number of Children (raised) by Sex, Broad Age group (in Months) and Economic Group	179
16:	Distribution of total number of Children by Sex, Broad Age Group (in Months) and Altitude	182
17:	Total number of Children (raised) by Sex, Broad Age group (in Months) and Main agricultural product at FA level.....	183
18:	Total number of Children (rasied) by Sex, Broad Age Group (in Months) and Ethnic Group of Mothers	184
19:	Total number of Children (rasied) by Sex, Broad Age Group (in Months) and Religion of Mothers	186
20:	Prevalence of Stunting by Region after and before introducing Sample Weight.....	187
21:	Percentage share of Households in each Region before and after introducting Sample Weight	188

I. Introduction

A. Background

It is widely recognized from earlier national surveys and small-scale studies that malnutrition is a serious problem in Ethiopia. The problem has two distinct aspects: acute malnutrition resulting from drought in some years and some geographic areas, and chronic malnutrition resulting from poverty-related factors occuring in all parts of the country. Over the years, acute malnutrition has, of necessity, dominated the attention of government and outside organizations. However, there is a growing recognition that the long-term solution to the acute problems is to improve the underlying poverty-related factors which give rise to chronic malnutrition. Based on many years of experience in Ethiopia and other countries, it is known that these underlying factors include household food security, health status and child care and feeding practices. These, in turn, are affected by a wide range of other factors (income, prices, markets, water, sanitation, hygiene, education, female work loads, etc.). In, short, chronic malnutrition is a reflection of the success or failure of development in many sectors, and acute malnutrition caused by drought and other events will continue to plague Ethiopia until chronic malnutrition is significantly reduced through progress in social, as well as economic, development.

Social and economic development generally is a very long-term process requiring the efforts of all sectors, even under favorable conditions. Ethiopia has clearly not enjoyed favorable conditions in recent decades and, indeed, has suffered from stagnation or decline in the overall economy and key sectors. The GDP per capita annual growth rate during the 1980's had fallen below zero. During this same period agricultural output growth rate was much below 0.5% while population growth rate was 2.9% (FAO 1989, Addis Abeba).

The country is currently undergoing widespread economic reforms to reverse these negative trends, and these are likely to continue and intensify over the foreseable future. While these reforms are necessary and highly desirable from a long-term perspective, they will also have strong effects on many aspects of human welfare during the transition. These effects may be positive or negative, depending upon the pace and way in which the reforms are pursued (Pinstrup-Andersen 1988). Nutrition is one aspect of human welfare, and is typically not the paramount concern of governments and international agencies as they attempt to redirect the economy. However, as described above, nutritional status is a useful and easily measured indicator of many aspects of human welfare and development processes. Thus, even though government and international policy makers do not base their reform-related decisions on nutrition in its own right or as a public health problem, there is strong justification for using indicators of nutritional status, among others, to assess the overall impact of their actions on human welfare and development processes.

Thus, there are strong reasons for the Ethiopian government and international agencies to be concerned about nutrition in its own right, and to be interested in nutritional status as an indicator of development processes during a time of important policy changes. This coincides with efforts over the past three years to develop a national nutrition surveillance system (NNSS), which began with a workshop held in Addis Ababa in May 1989 (ENI/RRC, 1989). This workshop recommended that a national technical committee be established to develop a plan for the NNSS. Soon thereafter, the committee was established,[1] start-up funding was obtained from UNICEF, WHO and FAO, a pilot project was undertaken (ENI/CSA, 1990) and a detailed plan for the system was developed (NTCNS, 1991).

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[1] The National Technical Committee on Nutrition Surveillance (NTCNS) has representation by the Ministry of Planning and Economic Development (Chair), the Ethiopian Nutrition Institute (secretariat), Central Statistical Authority, Relief and Rehabilitation Commission.

Most recently, a national survey was undertaken by CSA in March 1992, which is the central component of the overall system. This report presents the results from this survey and recommendations for follow-on activities.

B. Overall Design of the NNSS

The overall purpose of the NNSS is to provide information that will assist in incorporating nutritional considerations into a wide variety of long-term planning and policy decisions. This is conceptually and operationally distinct from other forms of nutrition surveillance, notablely from that associated with early warning and/or management of relief programs. These latter activities require simple, routinely collected, and rapidly transmitted indicators which are predictive of nutrition problems at a local level. By contrast, nutrition surveillance for long-term policy and planning is concerned with decisions taken at a national or international level. These decisions may be intra-sectoral (e.g., within ministries of agriculture, health or education) or cross-sectoral in nature (e.g. related to prices, wages and taxation). Some of these decisions are purposely designed to improve nutrition (e.g. supplementary feeding or nutrition education programs), but there are many other decisions which can have unintended or unanticipated effects on nutrition (positive or negative). The NNSS is intended to provide information relevant to many such categories of decisions. Although national decisions must take a variety of considerations into account, and nutritional impact is but one such consideration, the purpose of the NNSS is to provide information which might assist in anticipating the nutritional consequences whenever possible.

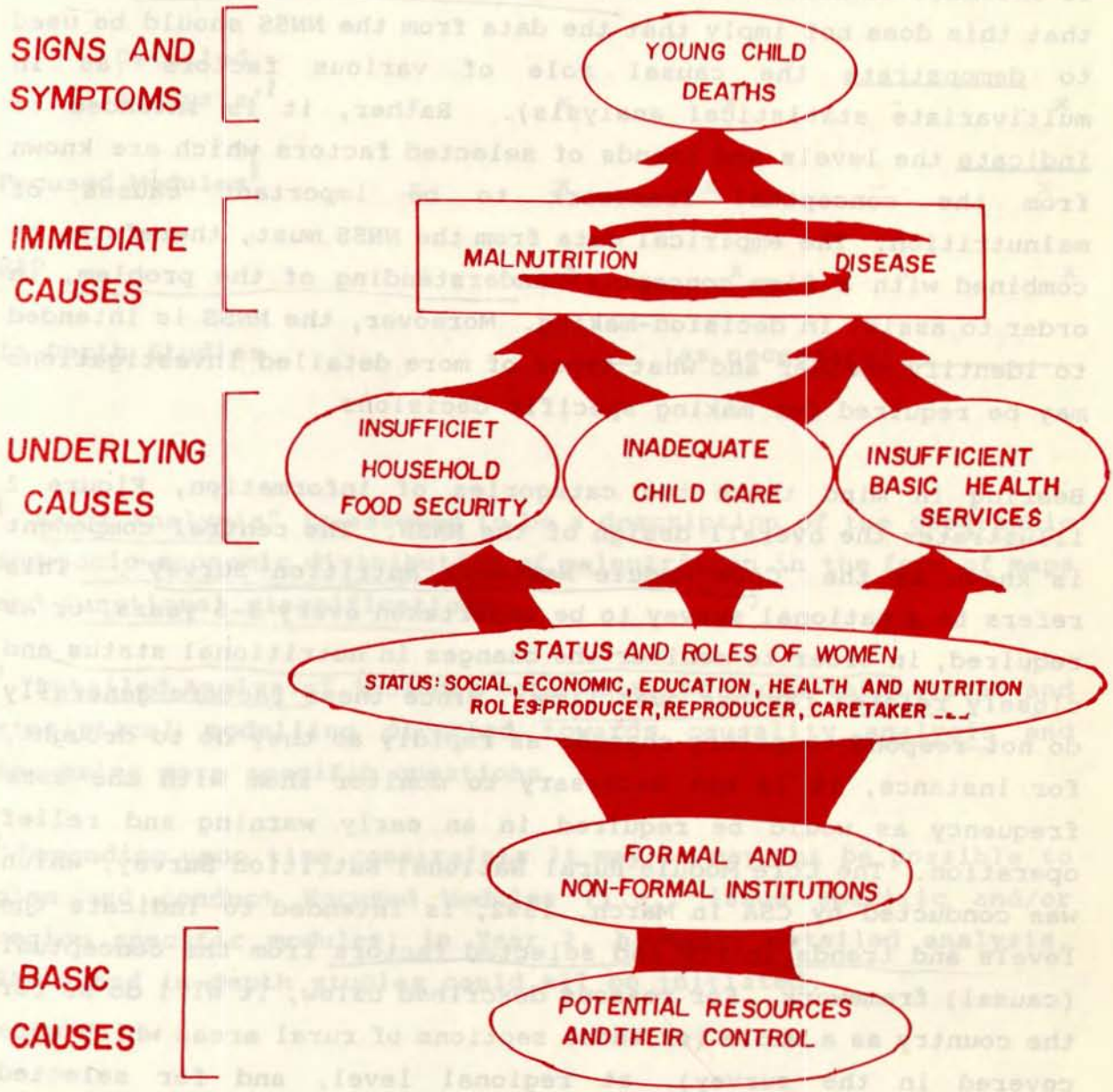
The NNSS is designed to provide two distinct categories of information. The first is information on the levels of malnutrition, and their trends over time, at the national level, regional level, and within selected socioeconomic groups. Although

Ethiopia suffers from many forms of malnutrition, at present the NNSS is designed to monitor the status of protein-energy malnutrition (PEM), which is by far the most widespread form of malnutrition and the one most likely to be affected by policy reforms in the coming years. Other forms of malnutrition, such as vitamin A deficiency, anemia and iodine deficiency disorders, also require serious attention but are not included in the present system.

The second category of information to be provided by the NNSS relates to the causes of PEM. The causes of PEM are well-known at a general level (Figure 1). The underlying causes are inadequate intake of energy and nutrients and poor health status which increases requirements and compromises the body's utilization of those nutrients which are available in the diet. These, in turn, are affected by a series of underlying causes: household food security, child care and feeding practices, environmental conditions affecting health and access to effective health services. It is important to note the important role which women play at this level. Women are traditionally responsible for all or an important part of the care and feeding of children, the upkeep of the domestic environment (water, sanitation, fuel), food production and other economic activities, and biological reproduction. Thus, any factors which impinge upon these factors or on women's work loads and time demands, may have important secondary effects on the nutritional status and/or welfare of children, of women themselves, or of other family members. The final level of causes depicted in Figure 1 illustrates some of the factors which influence nutrition through their impacts on women or on any of the three underlying causes of PEM (a shorthand for the latter being "food, health and care").

Although the causes of PEM can be stated with confidence at an abstract level such as this, the relative importance of one factor or another is highly context-specific. The context-specificity and multi-sectoral nature of PEM is what distinguishes it from other

Figure 1 - CAUSES OF MALNUTRITION AND YOUNG CHILD DEATHS



SOURCE: Modified from UNICEF Nutrition Strategy, 1990: New York

forms of malnutrition and makes it difficult to identify effective solutions. Moreover, these characteristics create the potential for a wide variety of decisions to affect nutrition for better or worse, by affecting one or more of the factors shown in Figure 1.

The second category of information provided in the NNSS, therefore, is intended to assist in a "causal" analysis of the problem. Note that this does not imply that the data from the NNSS should be used to demonstrate the causal role of various factors (as in multivariate statistical analysis). Rather, it is intended to indicate the levels and trends of selected factors which are known from the conceptual framework to be important causes of malnutrition. The empirical data from the NNSS must, therefore, be combined with a firm conceptual understanding of the problem, in order to assist in decision-making. Moreover, the NNSS is intended to identify whether and what types of more detailed investigations may be required for making specific decisions.

Bearing in mind these two categories of information, Figure 2 illustrates the overall design of the NNSS. The central component is known as the "Core Module National Nutrition Survey". This refers to a national survey to be undertaken every 3-5 years, or as required, in order to monitor the changes in nutritional status and closely related factors over time. Since these factors generally do not respond to policy changes as rapidly as they do to drought, for instance, it is not necessary to monitor them with the same frequency as would be required in an early warning and relief operation. The Core Module Rural National Nutrition Survey, which was conducted by CSA in March, 1992, is intended to indicate the levels and trends in PEM and selected factors from the conceptual (causal) framework. For reasons described below, it will do so for the country as a whole (or those sections of rural areas which were covered in the survey), at regional level, and for selected socioeconomic groups. The purpose of this report is to provide the "basic analysis" of results of this survey as shown in Figure 2.

Figure 2: Illustration of the Sequencing of NNSS Components

	Year 1	Year 2	Year 3	Year 4	Year 5
Core Module: Field	x	-	-	x	-
Basic Analysis[1]	x	-	-	x	-
Detailed Analysis[2]	-	x	x	-	x
Focused Modules[3]	-	x	x	-	x
RAP	-	x	x	x	x
In-Depth Studies	_____ (as necessary)_____				

[1] "Basic Analysis" is assumed to be a description of the geographic and socio-economic distribution of malnutrition in the form of maps and functional classifications.

[2] "Detailed Analysis" includes more detailed cross-tabulations and statistical modelling directed towards causality analysis and answering more specific questions.

[3] Depending upon time constraints it may or may not be possible to plan and conduct Focused Modules (i.e., issue specific and/or region specific modules) in Year 2, however, detailed analysis, RAP's and in-depth studies could all be initiated.

As shown in the figure, the NNSS also anticipates the potential need for a range of additional activities to be undertaken in the intervening years between rounds of the Core Module. These include more detailed analysis of the Core Module itself, focused modules (i.e., issue and/or region specific modules), rapid assessments (RAP) and in-depth studies as required. The need for these follow-on investigations is based on some positive experiences from countries which have employed them, and some negative experiences from countries which have needed them but did not anticipate this and could not provide the required information. It is expected that the results from the Core Module will indicate the geographic and/or socioeconomic groups with elevated rates of malnutrition, but the streamlined nature of the data collected in this national survey was not intended to provide, in one survey, all of the information potentially required by decision-makers in various sectors and government departments. Instead, the NNSS provides a flexible framework by which more refined policy questions may be posed based on the basic results from the Core Module, then investigated, in an iterative fashion, using the most appropriate and inexpensive approach in each case. Readers are refered to the overall plan for the NNSS for further details concerning these other components of the system and the potential roles and responsibilities of various national institutions.[2]

C. Organization of this Report

Building upon the foregoing rationale, the present report provides information on the following:

1. Methodology
2. RESULTS

    2.1- Levels of PEM in 22 regions covered in the 1992

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[2] Proposed Design for Ethiopia's National Nutrition Surveillance System. Prepared by members of the National Technical Committee on Nutrition Surveillance, January 15, 1991. (ENI, mimeo).

survey

2.2- Changes in PEM since the previous national survey in 1983, again on a region-specific basis

2.3- Levels of PEM in selected socioeconomic groups

2.4- The status of key nutrition-related factors, as suggested by the conceptual framework (Figure 1)

Some brief comments are warranted on each of these points, in order to guide the reader in the use of this report.

i) Levels of PEM

For reasons described in the next chapter, it was not possible to cover all rural parts of the country during the 1992 survey. However, data were collected from a probability sample in 22 administrative regions, representing a sizeable cross-section of the rural population. This sample is suitable for estimating the prevalence of different forms of malnutrition with adequate precision at regional level.

Tables are provided describing the levels of nutritional stunting (low height-for-age), wasting (low weight-for-height) and underweight (low weight-for-age). Stunting is a reflection of the lifelong experience of a child, since deficits in height continue to accumulate during early childhood, with most deficits occuring in the first 2-3 years and little or no catch-up growth thereafter. Stunting is sometimes refered to as an indicator of "chronic" malnutrition for this reason. Wasting, by contrast, is a reflection of the thinness of a child, which is independent of his/her height. Thinness tends to respond to more recent experiences (food intake and disease) and, in contrast to height, a child can recover from a bout of wasting once normal food intake and health status are re-established. Wasting is sometimes refered

to as an indicator of "acute" malnutrition. Underweight (weight-for-age) is a summary reflection of the degree of wasting and stunting in a child, because thinness and height deficits will both result in the child weighing less than normal for his/her age. Although it is sometimes useful to use such a summary indicator, its weakness is that it cannot distinguish between long-term and more recent experiences affecting the child. Therefore, the present report presents basic results pertaining to all three indicators (breakdowns by age, sex and region), but gives more emphasis to stunting and wasting in the more detailed tabulations.

For technical reasons which improve comparability across surveys, ages and indicators, and in keeping with W.H.O. guidelines, the present report also favors the use of Z-scores for expressing deviations in weight and height. Z-Score is defined as follows;

$$\text{Z- score} = \frac{\text{Individual's value - median value of reference population}}{\text{Standared Devaition (S.D) value of reference population}}$$

Most of the results discussed in the text refer to prevalences of stunting and wasting according to the criterion of -2 Z-scores cut-off point for height-for-age and weight-for-height, respectively. However, it is recognized that this may not be the practice in all surveys in the country (currently and historically), and therefore the results have been analyzed and presented in a number of other formats. Specifically, prevalences of stunting, wasting and underweight are presented using the "percent of median" methodology, and according to the percentile (decile) distribution of the reference population where by " an individual child by sex is placed in the appropriate decile of ten centile brackets of the reference population acoording to their individual weigth and heigth value". Results are also presented according to three categories of severity (mild, moderate and severe) for all three indicators. Finally a set of tables has been provided based on RRC/EWS recomendation of weight for lenght classification. The

interested reader will find these various supplemetal tables in the Appendix.

ii) Changes in PEM Since 1983

Due to the difference in coverage of the 1992 survey, it is not possible to derive an exact national estimate of malnutrition prevalence for comparing to the 1983 national survey. Using the former geographical classification in the previous survey Tigray, Eritrea and nomadic areas and in the present Hararge, Eritrea and nomadic areas were not covered. However, it is possible to compare the levels of malnutrition on a region-specific basis, based on the present 22 regions covered in the 1992 survey. The anthropometric data from the 1983 survey were re-analyzed for this purpose, in order to ensure that identical methods were used for deriving anthropometric indicators of nutritional status (Z-scores based on the CASP software program from the Centers for Disease Control, Atlanta, Georgia, USA). In addition, some of the 1992 regions were re-grouped to correspond to the regional boundaries as used in the 1983 survey. In a few cases (i.e. Gamo Gafo, Sidamo, Illubabor and Bale) this required re-assigning individual awrajas to different regions.

A major concern in comparing the results from two surveys is often whether there may have been non-sampling (i.e. measurement) errors in one or both surveys that could produce spurious estimates of nutritional improvement or deterioration. As described in Appendix 3 , there is reason to believe that the 1983 survey had more random measurement errors than the 1992 survey. It is less clear whether there was any systematic measurement errors in either of the surveys that would affect the ability to validly detect changes at regional level. The distinction is important, because if the error is completely random in nature, then the prevalence estimates would be affected but the mean Z-scores would not be biased. However, if the errors are systematic in nature (i.e. systematic over- or underestimation of age, weight or height), this would affect both

prevalences and means.[3] For these reasons, the analysis of changes between 1983 and 1992 will consider mean level of the indicators as well as the prevalences.

iii) Levels of PEM in Selected Socioeconomic Groups

One of the reasons for the common practice of presenting nutrition and other survey results by geographic area is to identify pockets of the country with elevated rates of malnutrition, identify the reasons for high rates, and target appropriate actions to reduce or eliminate the problem. The same rationale can be applied for disaggregating results according to other characteristics of communities and households.

This report has chosen several "structural variables" for use in classifying the rural population (in addition to the regional classification mentioned above). The rationale for choosing these variables is presented in Appendix I. The variables are:

- Altitude (including cross-classification by region):

  800-1599 m
  1600-2399 m
  2400-3199 m

- Agricultural System (an FA level characteristic):

  cereals
  roots
  cereals+roots
  coffee
  cereals+cash crops
  cattle
  other

[3] It should be noted that systematic errors by individual enumerators will not necessarily have a systematic effect on regional means, unless all or most enumerators in the region have errors in the same direction. If some enumerators over-estimate age, weight or height and others under-estimate these, then the effects are identical to random error at the regional level and the means would not be biased. This is an important consideration, since this report is primarily concerned with examining changes at the regional level.

- Ethnic Group (18 groups with sufficient sample size)
- Primary Source of Household Income (15 categories):
  - cereals
  - roots
  - cattle
  - chat
  - coffee
  - other cash crop
  - cereals+roots
  - cereals+cattle
  - roots+cattle
  - daily labor
  - firewood and charcoal sales
  - crafts sales
  - traders
  - civil servants
  - others

In addition to these basic classifications, some of the groups are sub-divided further as appropriate. A notable example is that some of the larger crop categories are divided according to the size of their cultivated area. Size of area has a major influence on household income and food supply, and a variety of government policies are likely to have different effects on small-scale farmers as compared to large-scale farmers.

It should be stressed that the above classifications are used in the present report, but that different versions may be possible and desirable depending upon the needs of various users. A case in point are the ten agro-ecological categories described in the draft Food and Nutrition Strategy. If this or other classifications are considered useful by various users, the NNSS has the capability to produce supplemental tables on that basis.

Finally, whenever possible the results are presented separately for young children (<24 months) and older children (≥ 24 months). This is because of the marked biological and behavioral differences known to exist between younger and older children. Younger children are more prone to disease (due to immature immune systems), have very high nutrient requirements relative to their

body size, are highly dependent upon mothers and other caretakers for support, and are subject to the stresses of the weaning period which extends from about 6 months to 30 months. Older children are generally expected to follow the adult diet and to feed themselves at meal time (including competing with other children when food is limited). Thus, it is to be expected that the three underlying causes of PEM (food, health and care) will operate differently between younger and older children, and that disaggregation of the results by age may provide greater insights into nutritional vulnerability across socioeconomic groups. It should also be noted that, for policy purposes, greater emphasis should be placed on younger children, precisely because this is when inadequacies in food, health and care have their greatest effects on the child. At the international level the practice of focussing on "under-fives" as the vulnerable group is now being replaced by greater emphasis on the "under-threes" when resources are limited and preventive actions are being sought.

iv) Nutrition-related factors:

In order to assist in the identification of factors in need of intervention within various geographic or socioeconomic groups, this report uses some of the same structural variables (described above) to examine indicators of food, health and care. Specifically, the following characteristics are presented:

- Health-related factors
  - Incidence and duration of illness
  - Types of illness (symptoms)
  - Water Source
- Child Feeding and Care
  - Initiation of breastfeeding
  - Duration of exclusive breastfeeding/ age of introduction of first weaning foods
  - Total duration of breastfeeding
  - Traditional use of other foods/liquids at birth
  - Types of weaning foods
  - Mothers' ability to recognize wasted children

o The Situation of Mothers

Number of young children requiring care
Prevalence of motherhood at young ages (<20 years)
Mothers' education levels
Fathers' education levels
Prevalence of female-managed households

Notably absent from this list are indicators of household food security or access to food. This was not an oversight, but rather a decision reached after much discussion concerning methodological problems, by members of the National Technical Committee on Nutrition Surveillance. The methodological problems are due to several factors. The primary one is that household food security can be achieved through a variety of household economic strategies, including own production, drawing upon stocks, purchasing from markets, collecting wild foods and so on. There is similar diversity in the sources of cash income and material assets which a household can draw upon to purchase food from markets. The importance of various strategies differs widely across different regions of the country and at different times of the year. Since the present survey took place at only one time of the year and the data collection instruments had to be kept fairly short and simple, it was not possible to derive indicators of household food security which could confidently be considered valid for inferring differences in food security among geographic and socioeconomic groups. Similar problems have been encountered by other groups working in Ethiopia and other countries, and the matter is presently the subject of research in several institutions. Until such time as appropriate methodologies are developed, it was felt that the NNSS should not collect indicators which have questionable validity for making comparisons across groups. Moreover, in light of the constraints associated with conducting the core module of the NNSS, it was felt that food security and issues related to it (e.g., marketing arrangements, prices) could be more appropriately

examined in a "focused module" during the period between core modules.[4]

D. Intended Uses of this Report

In light of the conceptual framework described earlier (Figure 1), it is apparent that malnutrition is a reflection of, and can be caused by, a wide range of factors. Many of these are directly or indirectly influenced by government action, while many others reflect the traditional knowledge, attitudes and practices of individuals, households and communities. In light of the multi-sectoral nature of the problem, it is useful to briefly distinguish several ways in which the results in this report can be used.

1- To identify purposeful interventions: This includes a wide range of programs like supplementary feeding, nutrition education and improved water and sanitation in the health sector; it may also include targeted food subsidies, food-for-work, transfer of improved agricultural technology, wage policies and the like in other sectors. In the case of the latter examples, there are often other reasons for undertaking such actions (other than nutrition), but nutritional improvement may be an implict or explict justification for the action. The NNSS results may be used to identify the groups most in need of such purposeful interventions (i.e., they may help with targeting decisions) and to justify increased expenditures for such interventions. They may also help indicate which types of interventions may be most appropriate in various groups, although this may often require some type of follow-up investigation for confirmation.

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[4] For those users most interested in the relevance of food security to the indicators of nutritional status presented in this report, it may be possible to obtain data from other sources to compare across regions. Obvious possibilities include data from the Food Information System (FIS) and the Early Warning System.

2- To assist on-going policy analysis and review: While the identification and targeting of purposeful interventions may be the most obvious use of this report, the motivation and resources for such actions are usually rather small in comparison to the many other decisions which can have unintentional but pronounced effects on nutrition. By bringing to light which groups in society are most susceptible to malnutrition, the present report can assist planners and advisors to analyse or review the potential impact of diverse policy decision on nutrition. For example, if the vast majority of malnutrition occurs in cereal-producing households this should suggest to planners that polices affecting the production, distribution, pricing and consumption of cereals are far more important to nutrition than policies affecting cash crops, despite the controversy which generally surrounds the latter. In addition, if malnutrition is higher among small-scale cereal growers than large-scale growers (>1.5 ha) this should cause planners to examine whether and how existing policies and programmes related to improved agricultural technology might benefit or harm small-scale growers (directly or indirectly); numerous possibilities may exist for enhancing the benefits and reducing the possible risks to small-scale farmers through modifications in the design of policies and programmes. Thus, the availability of information concerning the relative rates of malnutrition in different groups, and the relative sizes of these groups in absolute terms, is fundamental to an on-going review of policies which may not be designed to improve nutrition but should be examined for their potential nutritional relevance.

3- To identify issues requiring more detailed information: As important as the above applications are, it would be a mistake to assume that the present report, or the survey upon which it is based, would be sufficient to fully guide all potential policy decisions. Thus, in some cases the results may serve primarily to highlight some crucial areas for further

investigation through other components of the NNSS. This use of the survey data should be used sparingly, so that it does not become an excuse for inaction or for undertaking further research for its own sake. However, it is also important that users of this report recognize the possibility of pursuing this option when necessary.

II. SURVEY METHODOLOGY

A. Objectives of the Survey.

The general objective of the NNSS core module survey is primarily to assist government in setting objectives, policies and strategies for improving nutrition, provide a basis for reviewing progress and evaluating on-going programs, projects and policies in the country, including those with explicit nutrition objectives and those which may have unintended nutritional consequences, and provide a guideline information that would help donors for rationalizing their inputs into development.

Specific objectives of the rural core module nutrition survey of the NNSS is to provide:

i) Regional averages of prevalence of PEM and nutritional maps
ii) Information on agro-ecological and socio-economic groups with relatively high rates of malnutrition and;
iii) Information identifying such groups of the population requiring special attention with relative size of various functional classes as a proportion of the total population and possibilities for intervention in the course of foreseeable economic reforms.

See the preceding section for the overall use of the results of present survey.

B. Scope of the Survey

The scope of the survey is limited to collecting data that would serve as yardstick indicators of malnutrition among children aged under five years along with some variables that would allow functional classifications.

Items included in the questionnaire were:-

i) anthropometric measurements (Height and Weight measurements of children aged 6-59 months)
ii) some nutrition related child health (status of health and types of illness during the last 14 days)
iii) feeding practices (type of food given at birth, type of food given to the child currently, breastfeeding practices)
iv) mothers remark on child growth and other demographic variables on children (age, sex, mother religion, mother ethnic group, mother age, mother and father education and birth order)
v) household particulars (head age, head sex, head education, head source of income, total cultivated land, source of water)
iv) community particulars (types of agriculture, altitude, endemic disease, month of maximum and minimum food supply)

For further detail refer to a copy of the questionnaire in the appendix, i.e, appendix 6.

C. Method of Data Collection and Reference Period

The survey questionnaire covered three major categories of information. The first one comprise community variables, and it was collected from community leaders. The second part was on household particulars and it was completed by interviewing the head of household. The third part, which was the core of the study, deals with children aged under five years. This part of the questionnaire was completed by interviewing mothers and by taking anthropometric measurements of children aged 6-59 months. All data collection was made by experienced lay interviewers of the authority.

The reference period for all items in the survey was the date of interview excepting for "types of food given to the child", and "child's health status" and for communities variables. The reference period for types of food was the last four weeks and for health status it was the last two weeks. The reference period for community variables was the 12 months preceeding date of survey. The survey (i.e, actual data collection) lasted for roughly two weeks: starting March 19.to the end of March, and in few cases to the first week of April 1992.

D. Geographical Coverage

At the time of the survey the country, excluding Eritrea, was divided into 29 administrative regions. Each region was divided into a number of awrajas (an equivalent of district) and there were 323 awrajas in the country. Each awraja was in turn divided into a number of Farmers' Association (or "Tabia" in the case of Tigray region) in the rural areas and into a few towns, each of which is divided into Keftegnas and Keftegnas into kebeles in the urban areas.

The nutrition survey covered the rural parts of all regions excepting those which had security problems during the time, and those which had exclusively nomadic populations. The total number of regions covered by the survey were 22, the uncovered once being Assosa, Assab, Dire Dawa, East & West Harage, Gambela and Ogaden. Out of a the total 245 awrajas in these 22 regions the sampling constituted 198 awrajas as target awrajas, out of which only 177 awrajas were covered by the nutrition survey, leaving 68 of the them uncovered basically because of two reasons. Firstly 55 of all the awrajas were not included or considered as target in the sampling frame due to inaccessibility arisen from various reasons and in some the populations were entirely nomadic. Secondly out of the remaining 13 were not covered by the survey because of security reasons. We have employed an adjestment factor to arrive at a regional estimate that would account for the uncovered awrajas. See appendix 5 for the procedure. The total number of

awrajas covered by the present survey in the 22 regions can be re-arranged to give the equivalent of the former 12 regions.

E. Sample Design

The Rural Nutritional Surveillance Survey was conducted in two stages stratified design with the aim of providing estimates of reasonable precision at regional level. Farmers Associations within Awrajas (sub-strata) were selected as primary sampling units and eligible households for the survey were then selected as ultimate units within the sample FAs. Eligible households for the survey were those which had members aged 6-59 months inclusive.

A total of 767 FAs were selected at the first stage out of which 609 were covered by the survey. The total number of sample PSUs were allocated to the different regions according to the population sizes of regions with additional requirement that would insure a minimum number of PSUs (i.e., 20 FAs) in each region. The selection of FAs from each Awraja was carried out using probability proportional to size, size being total number of households in each FA according to the 1984 population census. From each sample FA, selection of eligible households for the survey was carried out as follows. A fresh list of all households in each sample FA was prepared by distinguishing households having at least one child member aged 6-59 months, inclusive, from those not having. From the list of households with eligible children 25 were systematically selected.

As might have been expected certain households in the sample could have more than one such a child. However, all children within the selected households falling in the given age range were enquired in the survey.

Number of Awrajas, FAs and households covered by the survey in each region are shown in Table 1 and 2 below. See appendix 5 for estimation procedures of major parameters of interest.

Table 1 Distribution of Awrajas and FAs in Covered Regions

Region	Total Number of Awrajas			Total Number of FAs		
	in the Region	Targeted by the survey	Actually covered	in the Region	Sele-cted	Covered by the Survey
Arsi	12	12	9	1,103	35	27
Bale	13	11	8	471	35	20
North Omo	18	17	17	1,149	40	41
South Omo	5	2	1	52	20	13
East Gojam	7	7	7	764	35	34
West Gojam	10	10	10	745	33	32
Metekel	5	3	3	309	30	16
North Gonder	16	6	6	352	35	30
South Gonder	9	6	6	388	35	17
Ilubabor	16	15	15	1,725	40	39
Kefa	11	10	10	652	35	34
North Shewa	15	6	5	1,493	36	13
East Shewa	6	3	3	518	30	23
West Shewa	12	12	10	1,672	35	32
South Shewa	13	13	13	1,267	42	36
Addis Ababa	10	6	6	346	30	29
Sidamo	14	11	11	980	40	39
Borena	8	7	5	273	30	20
Tigray	8	8	8	857	40	39
Welega	20	18	10	1,678	40	25
North Welo	8	6	6	355	36	26
South Welo	9	9	8	743	35	24
All Region	245	198	177	17,892	767	609

Table 2 Distribution of FAs and Households in Covered Regions

Region	Number of FAs Covered by the Survey	Total Number of	
		Expected households	Actually covered households
Arsi	27	675	674
Bale	20	520	520
North Omno	41	1,052	1,052
South Omo	13	325	324
East Gojam	34	850	842
West Gojam	32	800	791
Metekel	16	400	395
North Gonder	30	750	750
South Gonder	17	425	424
Ilubabor	39	975	948
Kefa	34	851	851
North Shewa	13	325	325
East Shewa	23	575	571
West Shewa	32	800	800
South Shewa	36	900	898
Addis Ababa	29	725	717
Sidamo	39	975	973
Borena	20	500	500
Tigray	39	975	971
Welega	25	625	624
North Welo	26	650	643
South Welo	24	600	595
All Region	609	15,273	15,156

6 3
9,09-96

F. Training of Field Staff

Training was given at two stages; the first one was at the head office for selected professionals and for co-ordinators and heads of regional statistical offices who were to serve as trainers at the second stage training , and the second one was at regional capitals for interviewers and supervisors.

The first stage training, which lasted for five days (from 24 to 29 February 1992) was given by two senior staff members from health and nutrition experts team of the Authority and one professional from ENI. The first three days were spent on explaining and discussing the contents of the questionnaire including taking anthropometric measerements of young children correctly, and how to fill it, culminating in the completion of one copy of the questionnaire by every trainee through listening to a mock interview organized by and among the trainers and then discussing the entire process and performance. Then the trainees were divided into 10 sub-groups each group comprising about 6 members for the field practice on the fourth day. During the field practice, each group of trainees collected data and completed four copies of questionnaires by actually going to the households in rural settings, by identifying households with eligible children for the survey and interviewing the mothers and heads of the households on household income, child's age, feeding practice, etc. and finally weighing and taking height/length measurements of eligible child. The fifth day was spent on discussion of the field practice experience, and additional instructions were given to enhance the accuracy especially in age recording and in reading the measurement and overall discussion on how to undertake survey.

The second stage training was an enhanced duplicate of the first stage, with two more extra training days: one more for field practice and one more for discussion . That is, during the second stage training, by giving more emphasis on practical training, after spending the first three days indoor training, interviewers

and supervisors divided into smaller sub-groups (each group comprising about five enumerators and at least one supervisor) were taken out for field practice for two days. Each group completed the questionnaire at least for six households. This was done under on the spot observation of members of the training staff so that any errors made could be rectified during this session. After the first day field practice the group was returned to the center and spent the second day on discussion of the field practices experience. On the following day, trainees were again taken out for the second day field practices to different rural areas. The final day, as it was during the first stage, was spent on an overall discussion and on provision of additional instruction based on observations made during the field practice. Training in each region was given simultaneously starting from 10 to 15 march 1992, excepting for Gonder and Tigray, where there was about a week delay. The delay in Gonder was due to transportation problem while that of Tigray was due to new recruitment of interviewers.

G. Deployment, Data Collection and Supervision

Immediately after the completion of the first stage training at head office, all necessary equipment and materials for the survey were taken to regional centers by concerned regional heads. It was kept there until completion of the second stage training after which it was appropriately distributed to the relevant enumerators and supervisors and immedaitely deployed over all the selected farmers associations for data collection activity. Actual data collection started in mid March 1992 and most of it was completed by the end of the month. Only in a few cases was data collection prolonged until the end of the first week of April 1992.

Mode of transportation used for deployment from head office to regional centers included air plane, bus and four wheel drive vehicles, while deployment from regional heads to survey areas included bus, four wheel derive vehicles and draught animals.

According to CSA's orignal plan the manpower to be mobilized for the survey included more than 800 enumerators, about 180 supervisors, regional coordinators, regional heads and seniors staffs from head offices. Nevertheless, as it has been indicated in the "coverage," since all regions were not covered by the survey, the total number of enumerators mobilized were only about 650.

As far as institutional frame-work for undertaking the survey including supervision is concerned, CSA's enumerators are normally stationed in each of the sample FA's and leave their FA's only for participating in training for new surveys such as the present one. The data collection activities of 4-5 enumerators were supervised by a supervisor assigned to the awraja. In each region, there was a regional head and at least one assistant to the head responsible for the overall data collection activity, including executing a random and/or point supervision. There was also the Department of Field Operation and Regional Statistical Offices and the Health and Nutrition Statistics Experts Team of the Social and Housing Statistics Department at the head office that is providing logistic services and participating in the overall execution of survey operations.

This was the manpower and the general institutional set up mobilized for the undertaking of the survey. Nevertheless, there had been a serious problem of transportation problem specially for undertaking the supervision activity during the survey. As many of CSA's four wheel derive vehicles were not in good working condition, supervision especially at the lower levels, was not as strong as planned. Fewer numbers of visits to FA's and on the spot checks than considered optimal were made by immediate and senior supervisors. In all the 22 regions covered not more than 50 vehicles were mobilized. However, supervision by using draught animals and walking, relatively high quality of training and employment of experienced field staff compensated weaknesses in supervision and helped to keep the quality of the data reasonably good.

In the mean time four group of professionals from head office and the ENI were also moved to selected ten regions to visit the field operation. Random cheks in more than 40 FAs were made on to accuracy with which the measurements were recorded during these visits. Interviewers were witnessed from the beginning to the end so that possible non-sampling errors could be anticipated. Acording to the reports of these experts the performance especially by enumerators was rather more than satisfactory.

H. Retrieval, Editing and Clearing of the Data

Unlike deployment and data collection, retrieval of the survey materials was not made at the same time. In other words some regions with no transportation problems were able to retrieve the data immediately after completion of data collection and were able to reach the head office during the first week of April. In some regions however, retrieval was delayed by about two to three weeks due to primarily transportation problems.

Meanwhile seven editors and coders and three senior statistical technicians or subprofessionals were employed at headquarters for manual editing and coding the questionnaire as soon as they reached the head office from the feild. The kind of editing performed include checking that weight and heights measurements are in a permissible range for the age; the duration of breastfeeding was not exceeding the child's age, and age at which supplementation started; response codes were valid, and similar consistency checks. This lasted for about two weeks. The data from the manually edited and coded copies of the questionnaire were then keyed on to a computer tape in a mainframe. Data cleaning at pre processing level had also been performed (see appendix 2).

III. RESULTS

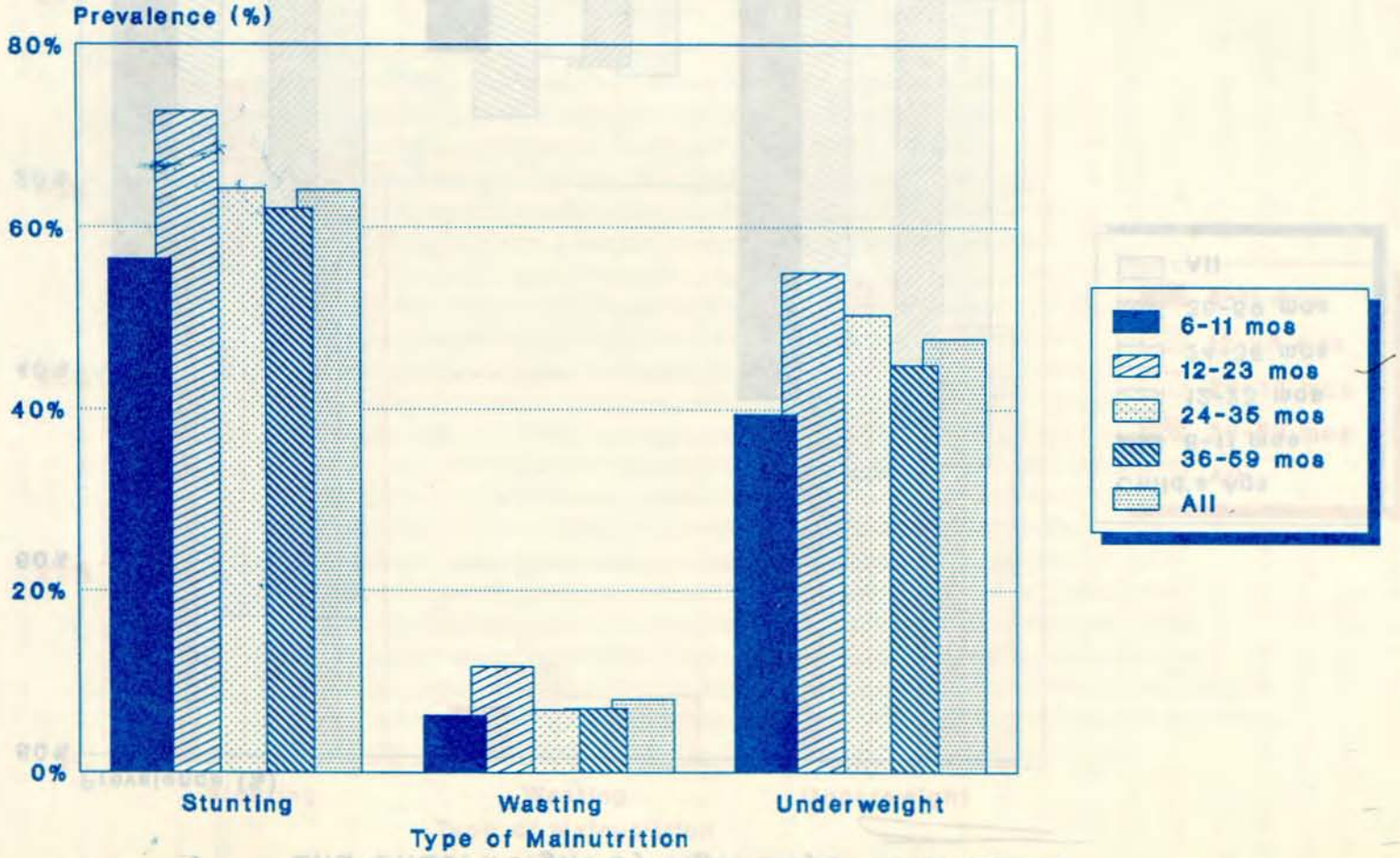
This section of the report focuses on overall findings following the outline provided earlier. In doing so it relies heavily on graphics, maps and tables to summarize key findings. In all cases these graphics are taken directly from the tables found at the end of the report. In addition, the reader will find further material in those tables, which cannot be adequately covered in this section without overwhelming the reader. Users of this report are urged to go beyond the results summarized in this section, to identify the results which may have particular relevance to their own applications. It would be also important to note that in this report children aged 6 - 11, 6 - 23 and 24 - 59 months are refered as infants, young children and older children, respectively. In presenting the findings, peresent tense has been uased mostly. But the result actually refer to the date of the survey.

A. National and Regional Levels of Malnutrition

For all regions covered in the 1992 survey, 64% of children aged 6-59 months are stunted (low height-for-age), 8.0% are wasted (low weight-for-height) and 47% are underweight (low weight-for-age). Figures 3 through 5 and Table 3 show that all three indicators are somewhat lower among infants (6-11 months), highest in the second year of life (12-23 months) and somewhat lower after 24 months.

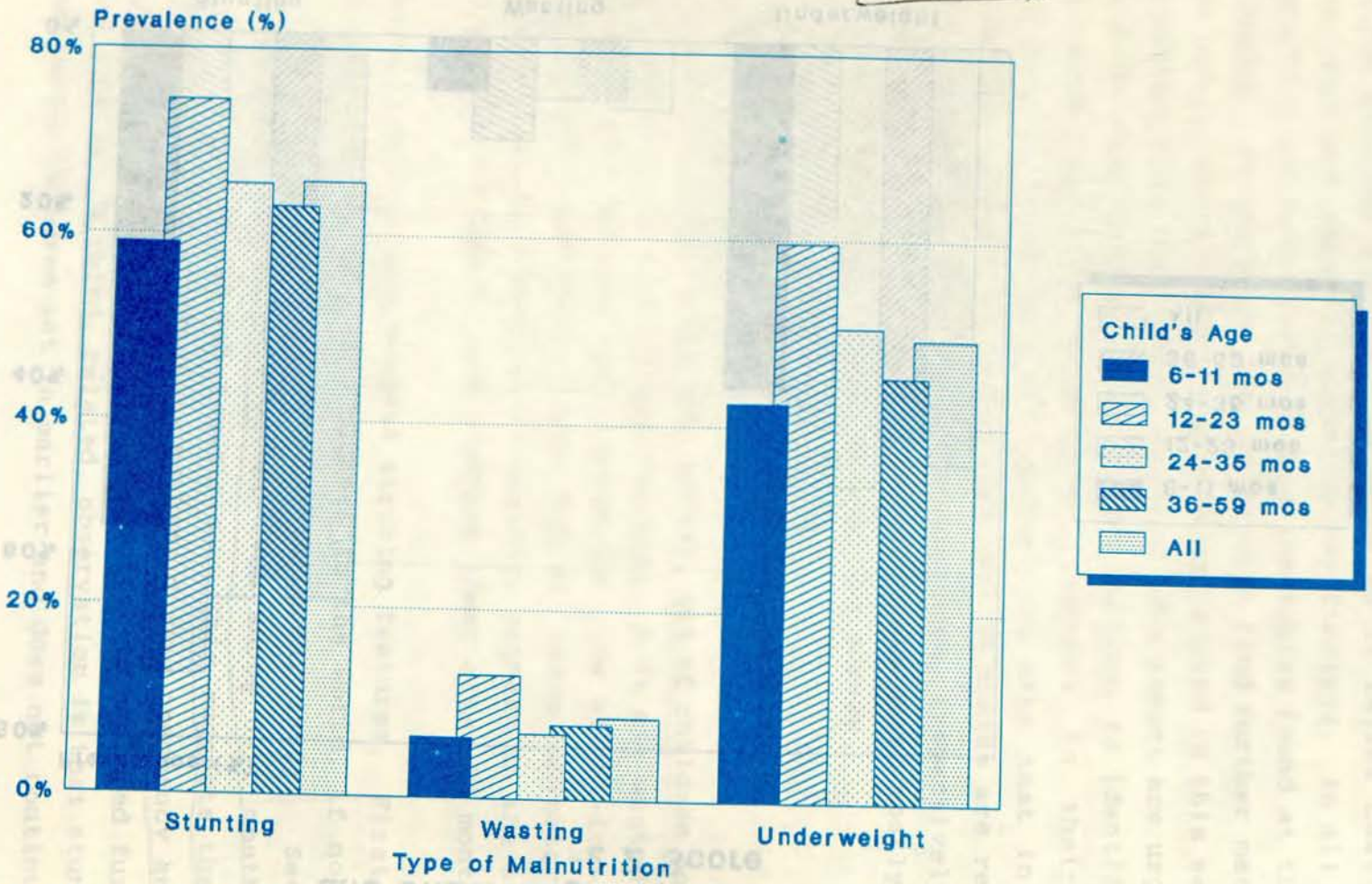
These overall results have several striking features. First, the level of stunting is among the highest in the world, if not the highest (UNICEF State of the World's Children, 1990). Second, stunting is already highly prevalent even among 6-11 month-old infants (59% for boys and 54% for girls). This suggests that it may be caused by factors affecting mothers during pregnancy and/or factors operating during infancy. This matter is explored further in a later section. A third, related, observation is that stunting in the Ethiopian Children set in earlier and does not continue to

Fig. 3-Prevalence of Stunting, Wasting and Underweight by Age: Both Sexes
< -2 Z Score



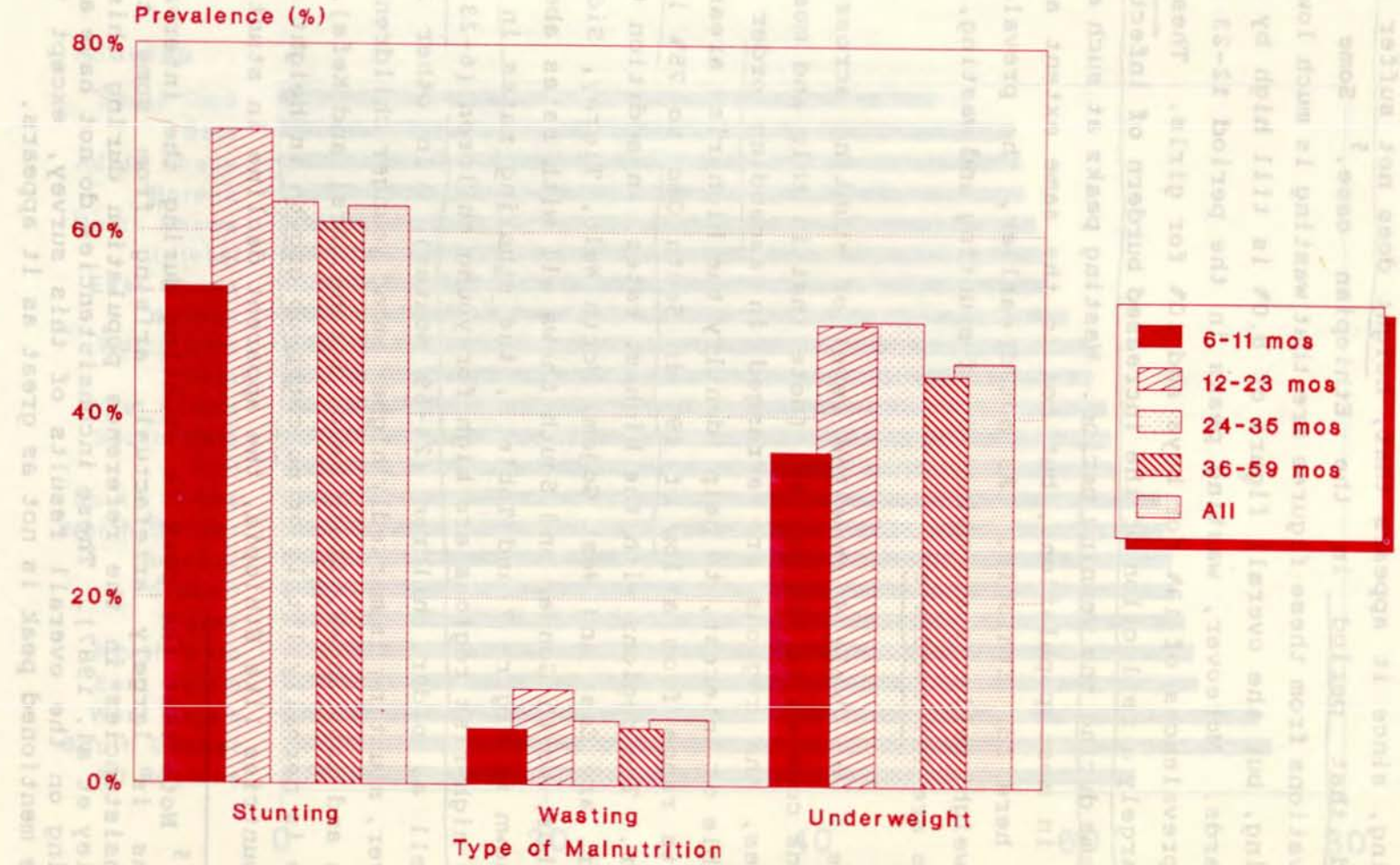
Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 4-Prevalence of Stunting, Wasting and Underweight by Age: Boys <-2 Z Score



Source: 1992 Rural Natitional Nutrition Survey, (CSA)

Fig. 5-Prevalence of Stunting, Wasting and Underweight by Age: Girls<-2 Z Score



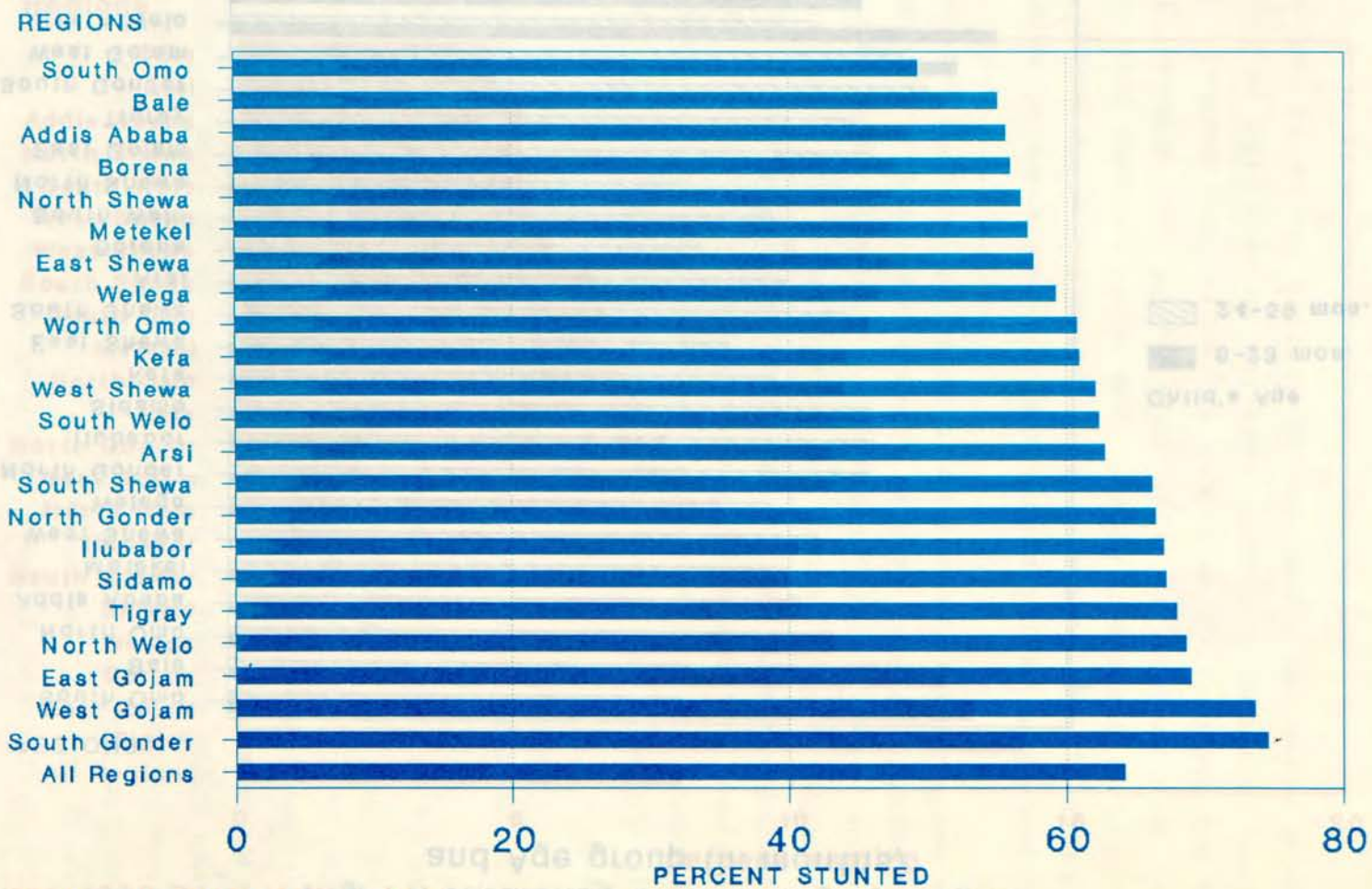
Source: 1992 Rural National Nutrition Survey, (CSA)

increase with the age of the child after infancy as it does in virtually all other populations up to the age of two. This reinforces the importance of the infancy period in the causation of stunting, since it appears that, height does not suffer greatly beyond that period in the Ethiopian case.[5] Some related observations from these figures are that wasting is much lower than stunting, but the overall figure of 8.0% is till high by African standards. Moreover, wasting peaks in the period 12-23 months, with prevalences of 13% for boys and 10% for girls. These peaks are largely a reflection of the increased burdern of infection and problems during the weaning period. Wasting peaks at such ages are found in most populations, but not to the same extent as those shown here for Ethiopia. As noted earlier, the prevalence of underweight reflects a combination of stunting and wasting, and the values are intermediate.

Figure 6 and Table 4 show the level of stunting across the 22 regions covered in the survey. (Note that in this and most other figures, the regions are arranged in ascending order of the variable of interest, to help identify the high-risk areas.) The results range from a low of 49% in South Omo to 75% in South Gonder. The regions with the highest rates, in addition to South Gonder, are East and West Gojam, North Welo, Tigray, Sidamo and Ilubabor, North Gonder and South Shewa all with rates above 66%. As shown in Figure 7 and Table 5, the stunting rates in most of these high-risk regions are high for young children (6-23 months) as well as older children (24-59 months). In other regions, however, stunting is markedly higher among younger children (North, South and East Shewa, South Welo, Borena, Arsi and Kefa). Since there is normally little or no catch-up growth in height observed in countries like Ethiopia, the apparent decline in stunting with

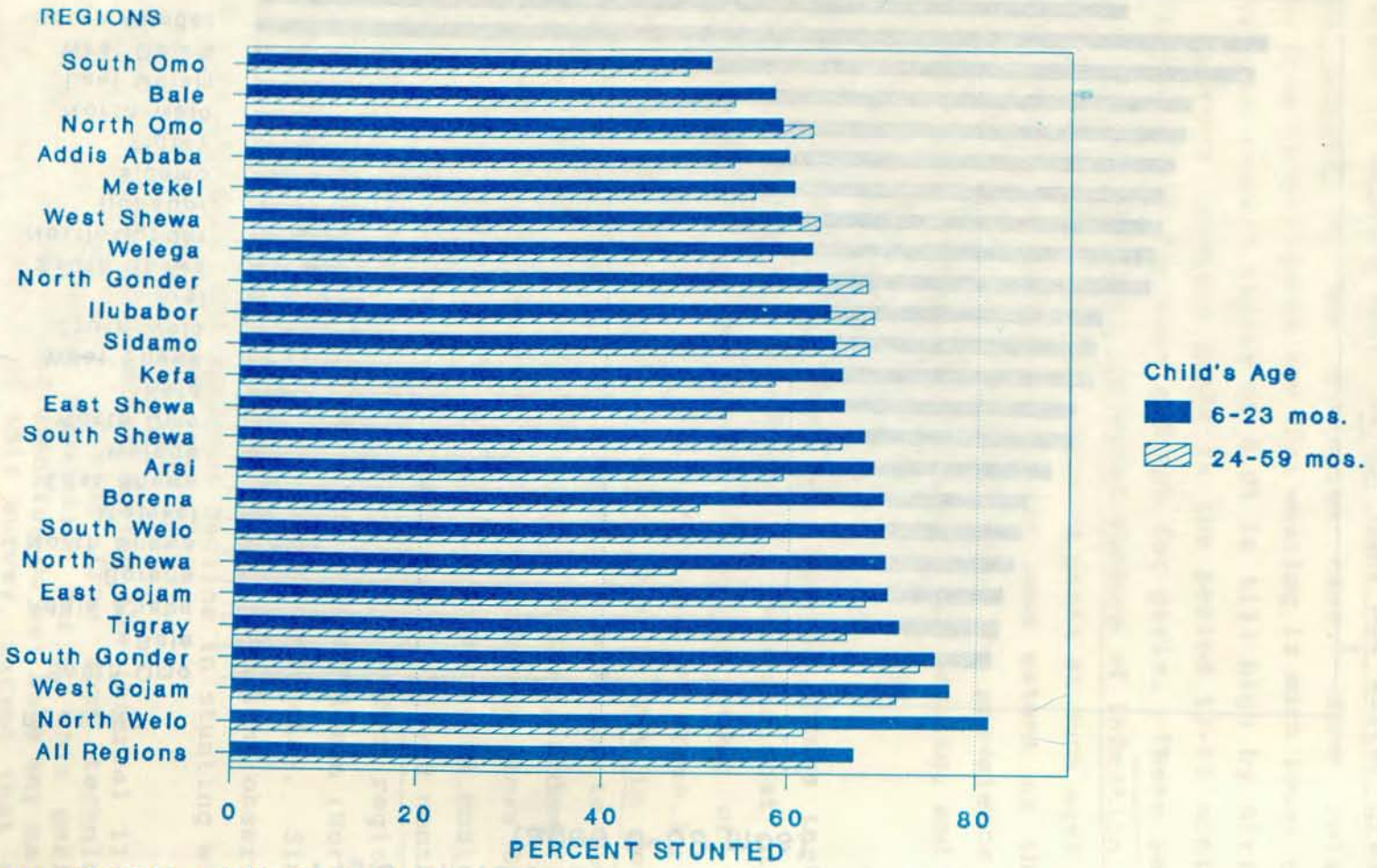
[5] Note that the peak in stunting during the interval 11-23 months is largely artefactual, arising from some technical inconsistencies in the reference population during this period (Dibley et al. 1987). These inconsistencies do not have any major bearing on the overall results of this survey, except that the afore mentioned peak is not as great as it appears.

Fig.6-Prevalence of Stunting by Region (ages 6-59 mos).



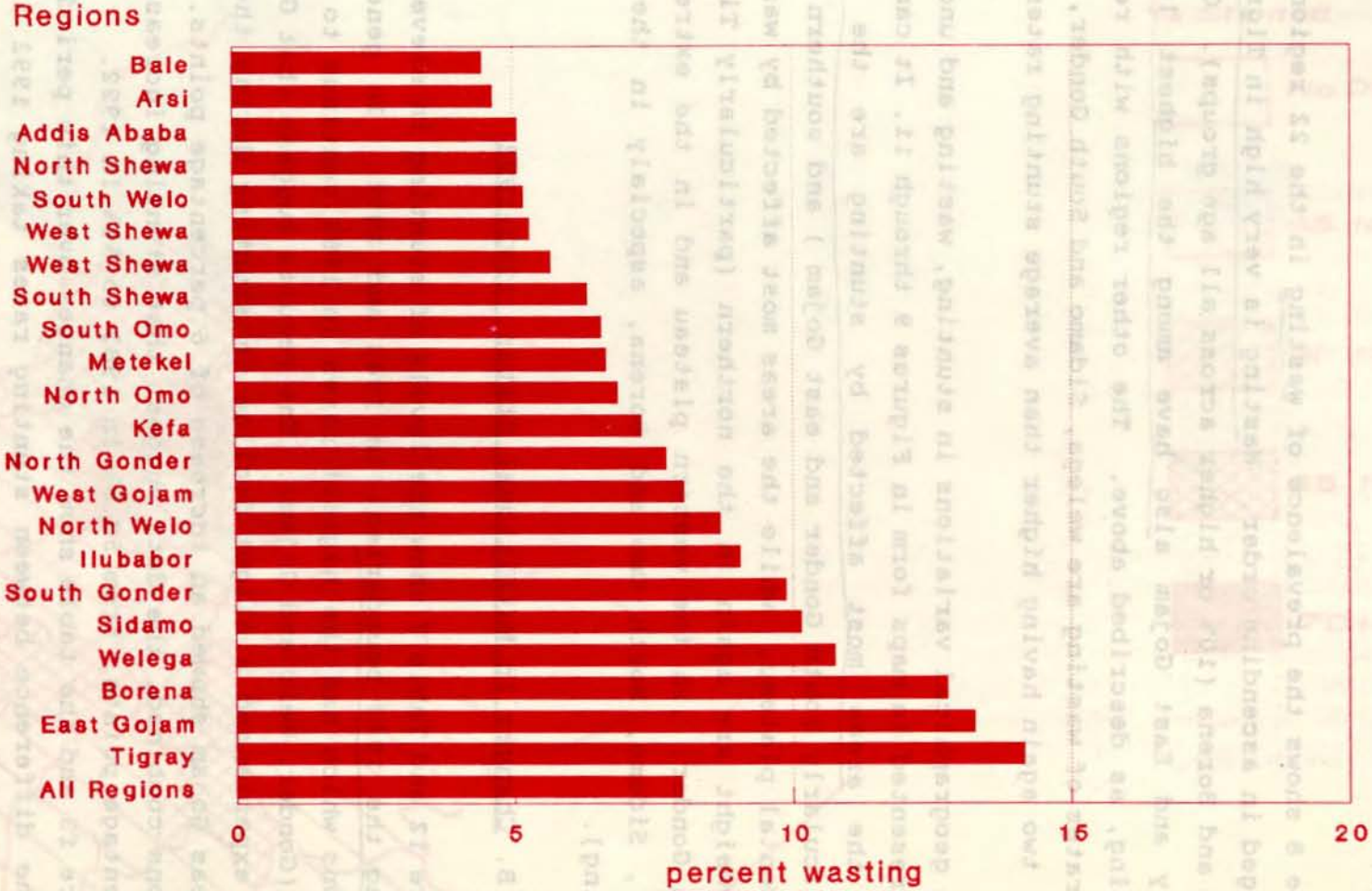
Source: 1992 Rural National Nutriton Survey, (CSA)

Fig. 7-Prevalence of Stunting by Region and Age group (in months)



source: 1992 Rural National Nutrition Survey, (CSA)

Fig.8-Prevalence of Wasting by Region (Ages 6-59 mos)



Source: 1992 Rural National Nutrition Survey, (CSA)

age in these regions may be due to time-dependent factors (e.g. drought epsoides of diseases, weaning complications, civil unrest etc) which affected the younger cohort much more than the older cohort.

Figure 8 shows the prevalence of wasting in the 22 regions, again arranged in ascending order. Wasting is very high in Tigray, East Gojam and Borena (10% or higher across all age groups). Of these, Tigray and East Gojam also have among the highest levels of stunting, as described above. The other regions with relatively high rates of wasting are welega, Sidamo and South Gonder, with the first two again having higher than average stunting rates.

These geographical variations in stunting, wasting and underweight are presented in maps form in Figures 9 through 11. It can be seen that the areas most affected by stunting are the northern (particularly south Gonder and east Gojam) and southern parts of the cental plateau, while the areas most affected by wasting and underweight are again in the northern (particularly Tigray and South Gonder) ,in the western plateau and in the extreem south (i.e., Sidamo, North Omo and Borena, especialy in the case of wasting).

B. Changes in Nutritional Status, 1983-1992

Figure 12 and Table 7 show the levels of stunting in eleven regions (using the 1983 boundaries) in 1983 and 1992. In general, the regions which had the highest rates in 1983 continue to do so in 1992 (Gonder, Welo and Gojam). The results suggest that Gonder and Welo experienced a slight decline in stunting during the decade, whereas Gojam showed an increase of 6 percentage points. For all regions combined, the data suggest that stunting increased by 4.2 percentage points, from 59.8% in 1983 to 64% in 1992.
Figure 13 and the table show the changes over this period in terms of the difference between stunting rates taking 1992 indicators asthe referance. When shown in this way the results suggest that

Fig. 9 Map of Stunting by Region

March, 1992

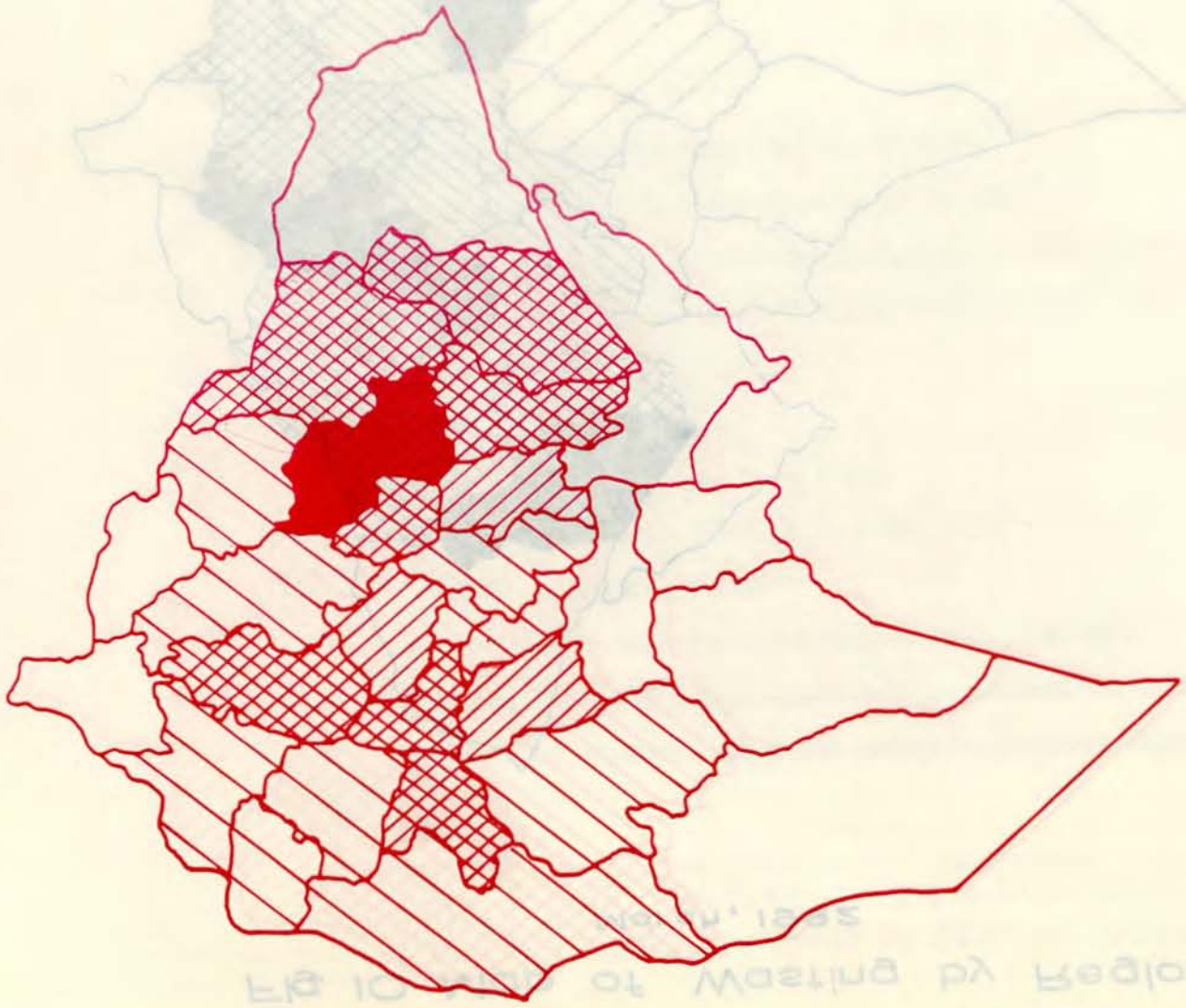


Fig. 10 Map of Wasting by Region

March, 1992

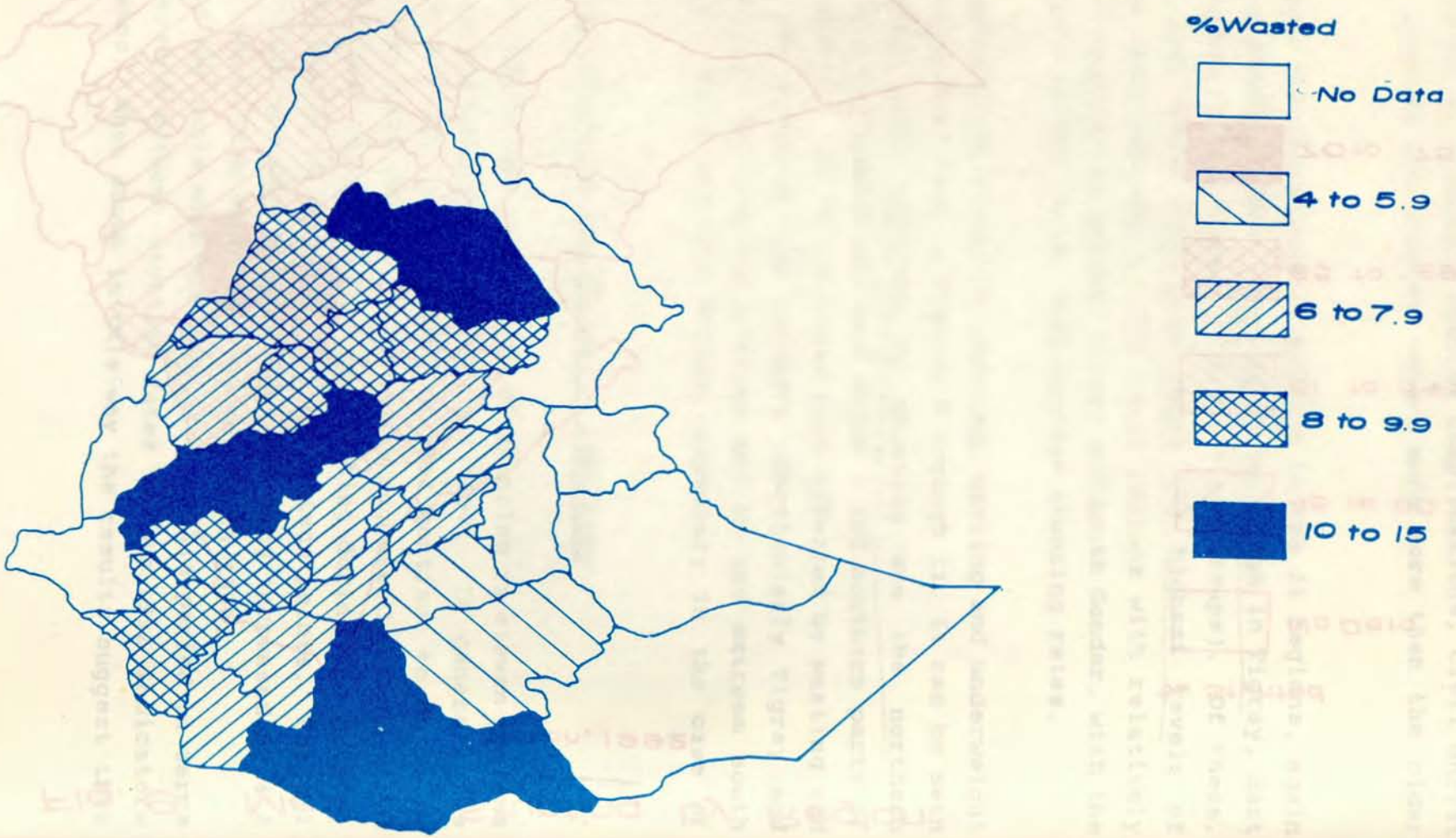


Fig. 11 Map of Underweight by Region

March , 1992

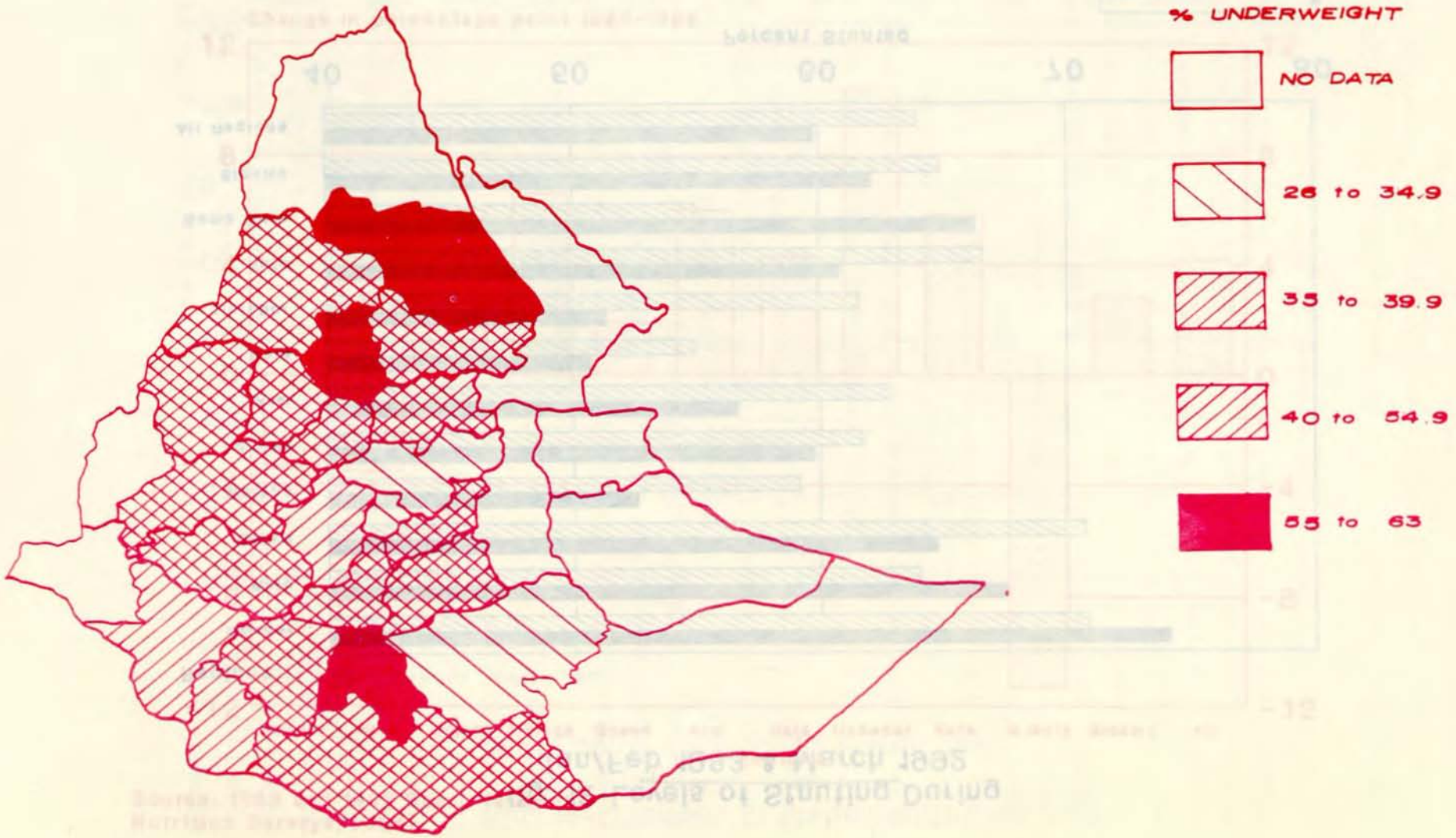
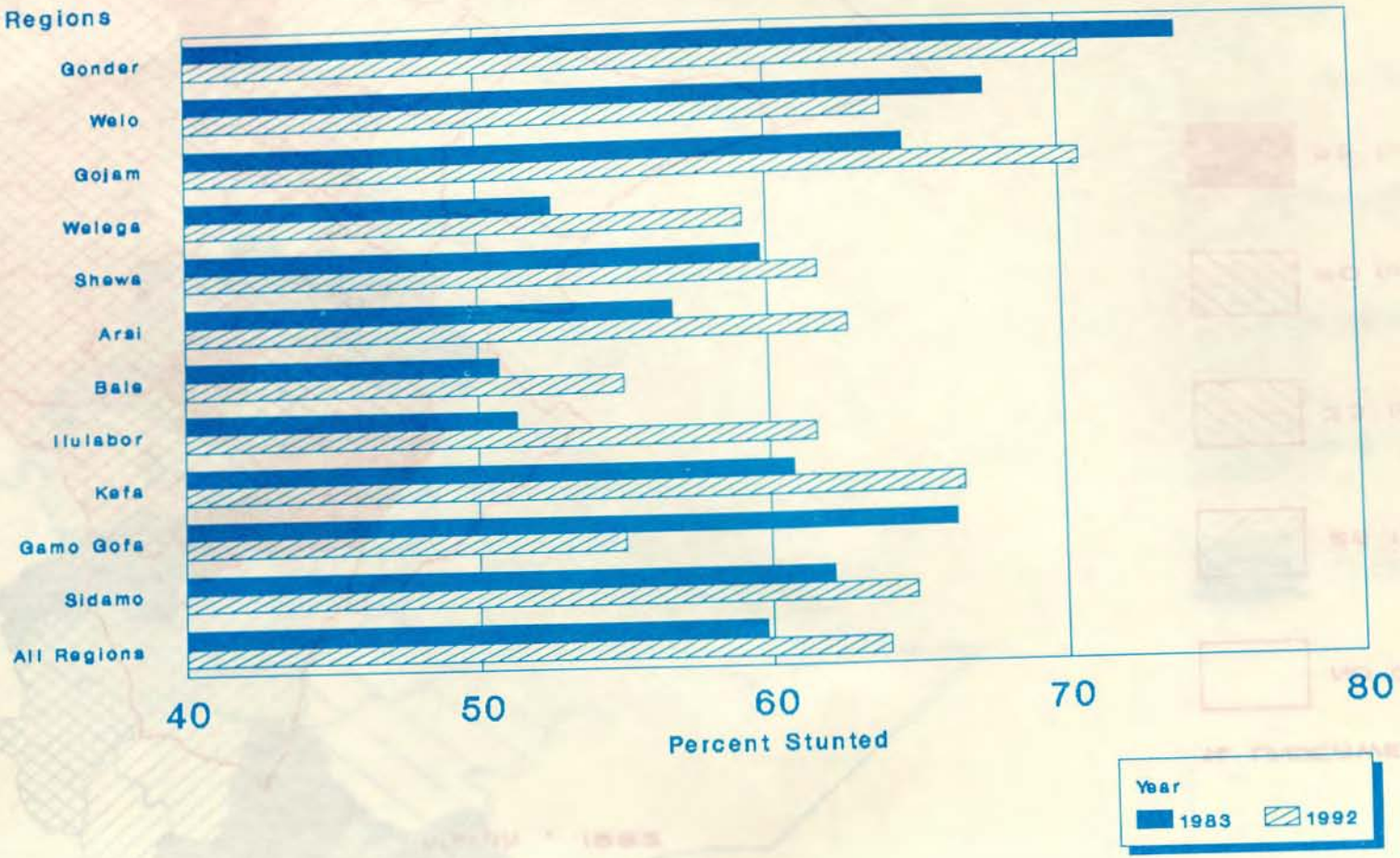
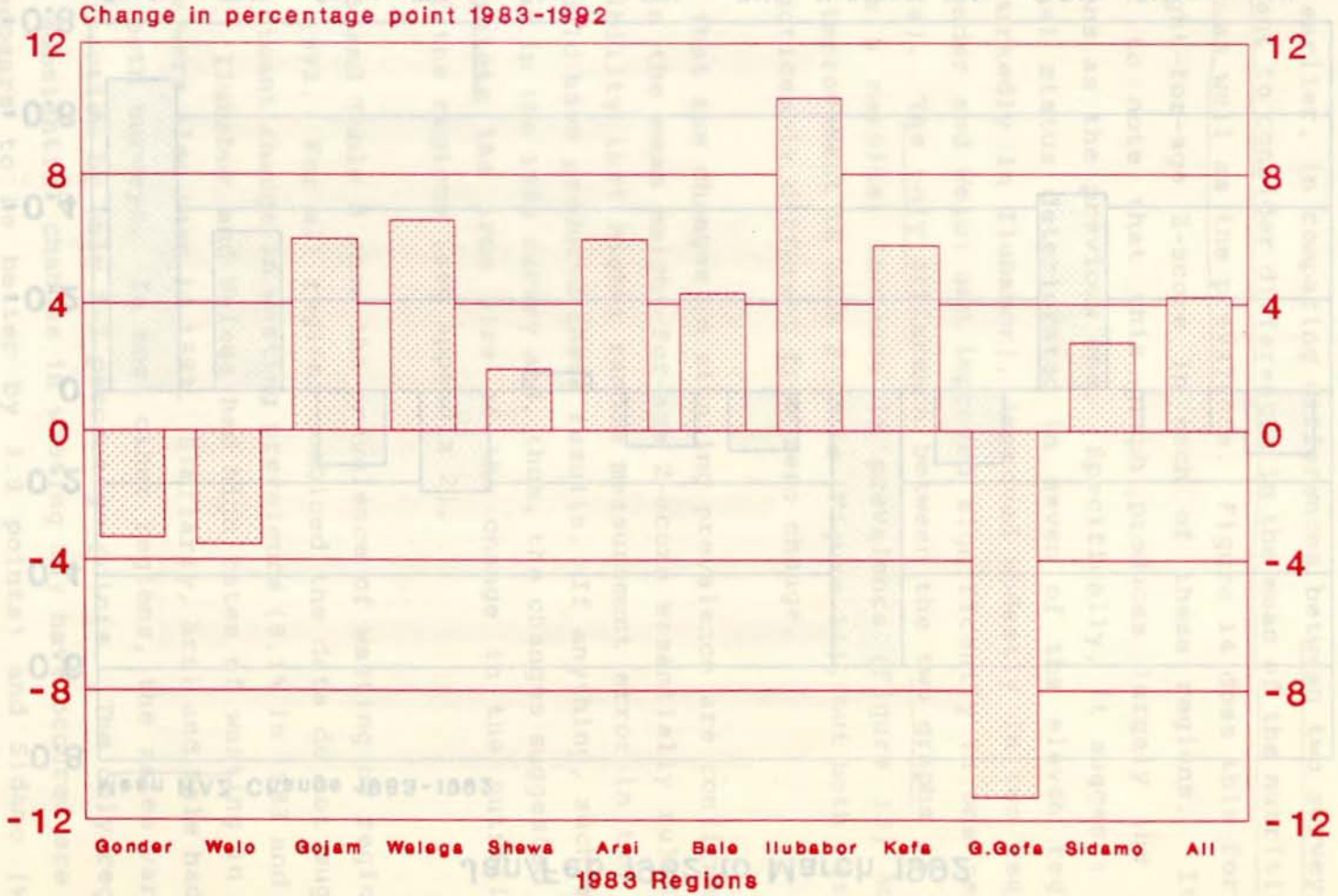


fig. 12-Levels of Stnuting During Jan/Feb 1983 & March 1992



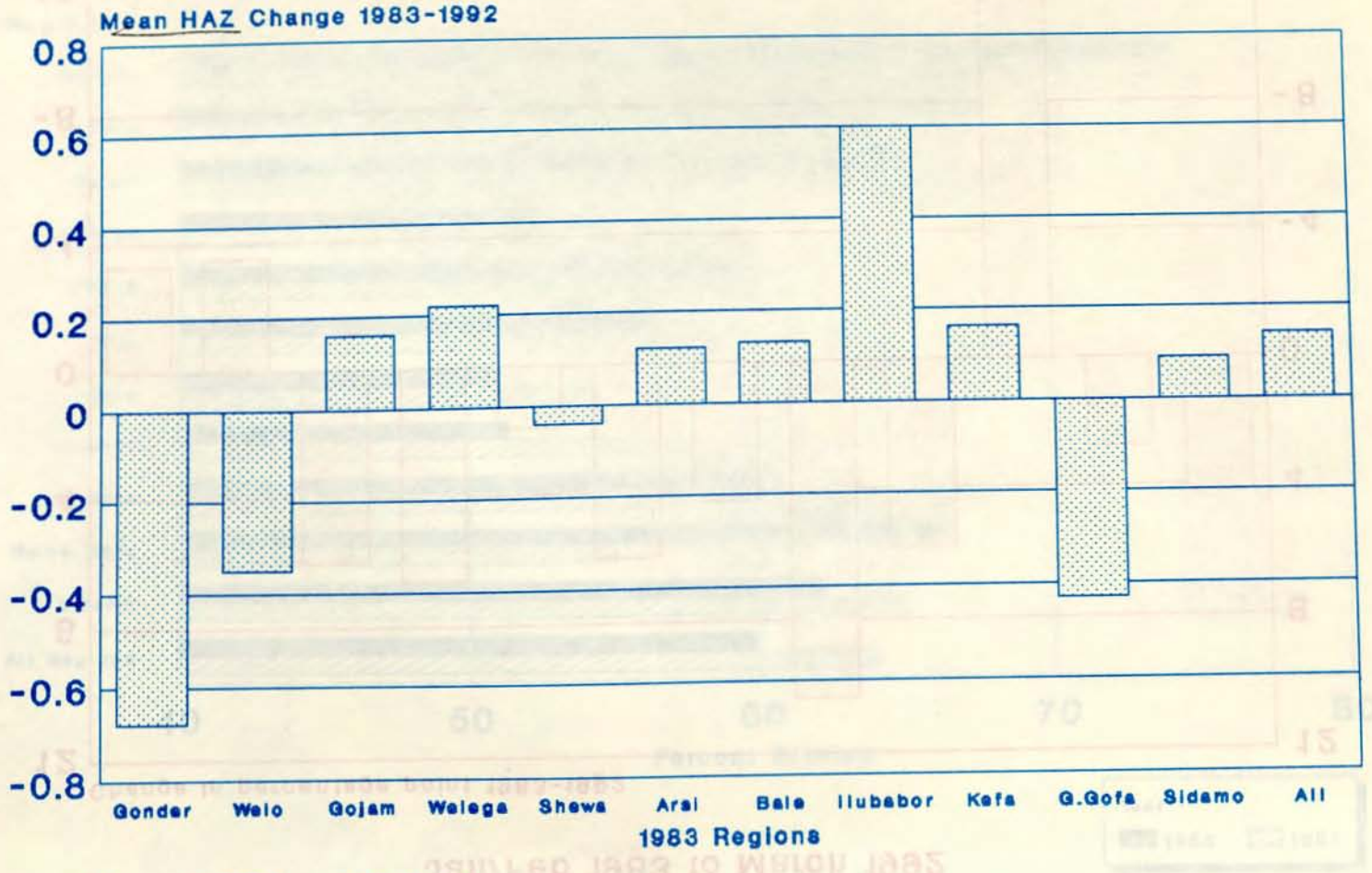
Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

Fig. 13-Change in Stunting
Jan/Feb 1983 to March 1992



Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

Fig. 14-Changes in Mean Height for Age Z Score Jan/Feb 1982 to March 1992



Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

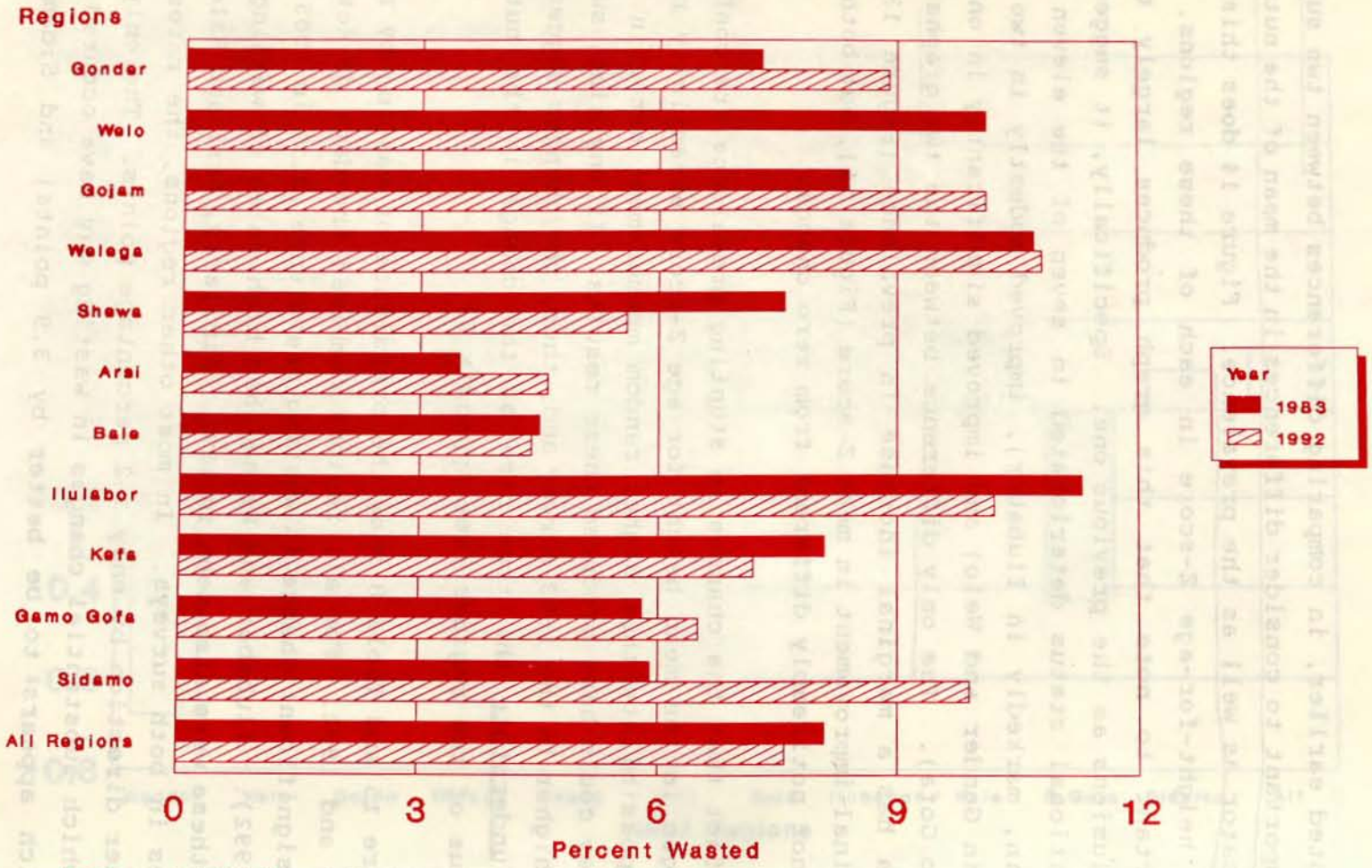
stunting increased in eight of the eleven regions (most markedly in Ilubabor), decreased modestly in two regions (Gonder and Welo as described above) and decreased markedly in one region (Gamo Gofa).

As noted earlier, in comparing differences between two surveys it is important to consider differences in the mean of the nutritional indicator as well as the prevalence. Figure 14 does this for the mean height-for-age Z-score in each of these regions. It is important to note that this graph produces largely the same conclusions as the previous one. Specifically, it suggests that nutritional status deteriorated in seven of the eleven regions (again, markedly in Ilubabor), improved modestly in two regions (again Gonder and Welo) and improved significantly in one region (Gamo Gofa). The only difference between the two graphs is that Shewa has a marginal increase in prevalence (Figure 13) and a marginal improvement in mean Z-score (Figure 14), but both results are not noticeably different from zero change.

The fact that the changes in stunting prevalence are confirmed by changes in the mean height-for-age Z-score essentially rules out the possibility that higher random measurement error in the 1992 survey could have produced these results. If anything, such error was higher in the 1983 survey and, thus, the changes suggested here may understate the true size of the change in the nutritional status of the regions (see Appendix 2).

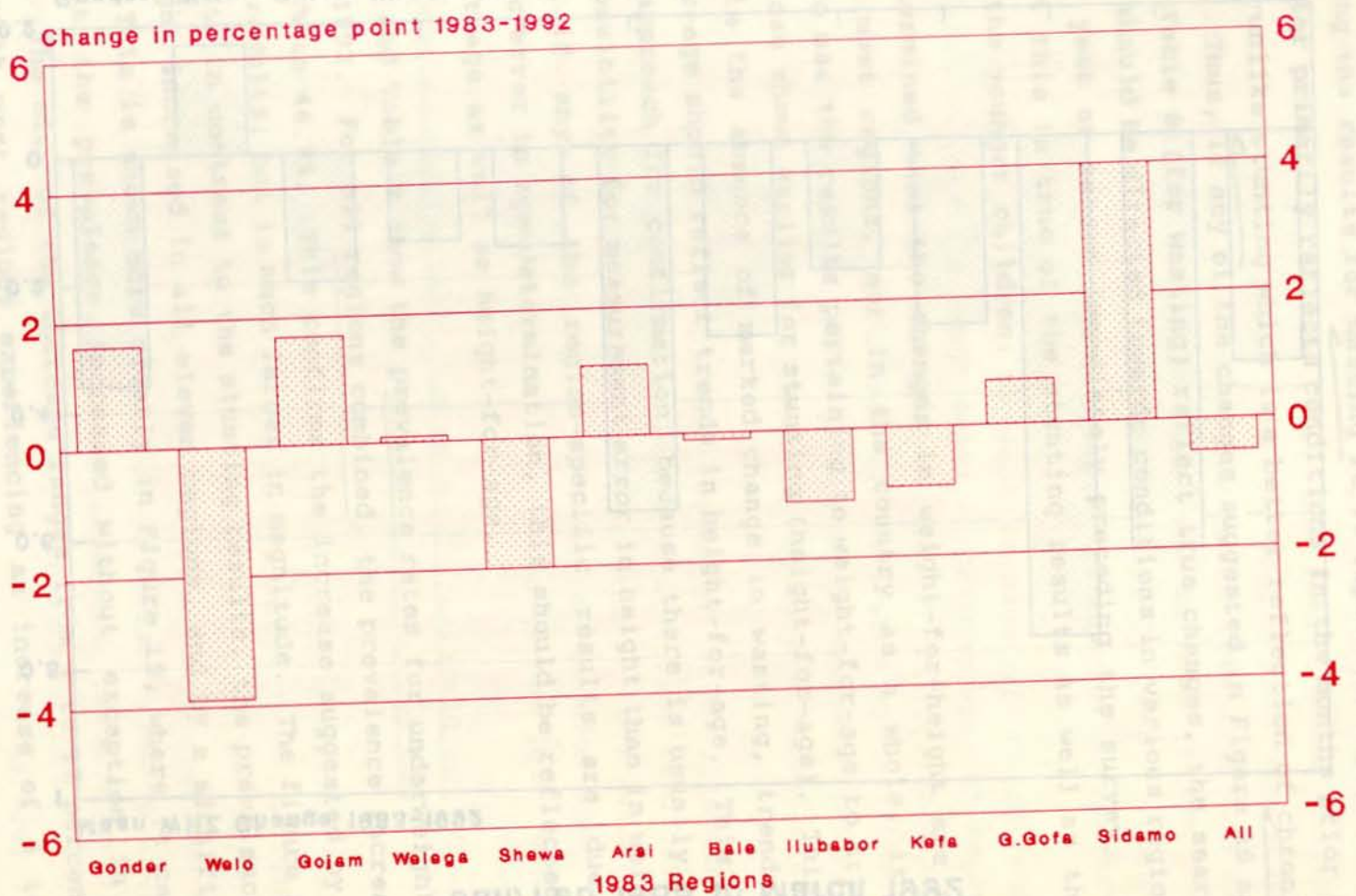
Figure 15 and Table 8 show the prevalence of wasting by region in 1983 and 1992. For all regions combined the data do not suggest any significant change in wasting prevalence (8.1% in 1983 and 7.6% in 1992). Ilubabor and Welega had high rates of wasting in 1983 and these were also seen in 1992. Similarly, Arsi and Bale had low rates in both surveys. In most other regions, the rates vary in either direction by only 1-2 percentage points. The only regions in which substantial changes in wasting may have occured are Welo (which appears to be better by 3.9 points) and Sidamo (where

Fig. 15-Level of Wasting During Jan/Feb 1983 & March 1992



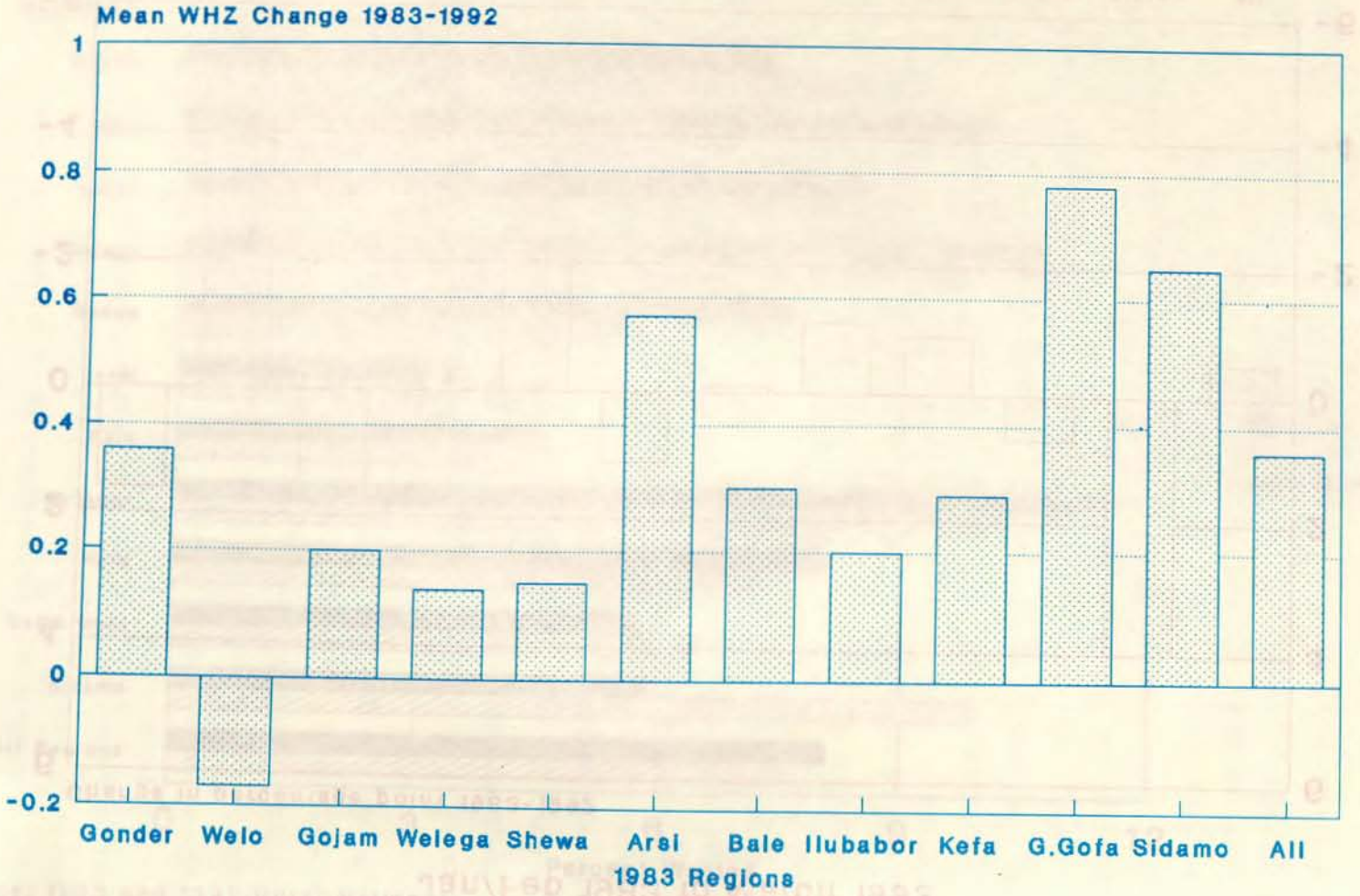
Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

Fig. 17-Changes in Wasting
Jan/Feb 1983 to March 1992



Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

Fig. 16-Change in Mean Weight for Height
Jan/Feb 1983 to March 1992



Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

wasting appears to have worsened by 4 points). These results are shown more clearly in Figure 16 and 17.

In evaluating the results for wasting it is important to note that this indicator primarily reflects conditions in the months prior to the survey, unlike stunting which is a better reflection of chronic conditions. Thus, if any of the changes suggested in Figure 16 and and 17 and Table 8 (for wasting) reflect true changes, the search for causes should be directed towards conditions in various regions during the year or season immediately preceding the survey. To some extent this is true of the stunting results as well as they relate to the younger children.

Having determined that the changes in weight-for-height are not marked in most regions, nor in the country as a whole, it is possible to use the results pertaining to weight-for-age to try to confirm those shown earlier for stunting (height-for-age). This is because, in the absence of marked change in wasting, trends in weight-for-age should reflect trends in height-for-age. This is a valuable approach for confirmation, because there is usually much greater possibility for measurement error in height than in weight. Moreover, if any of the region-specific results are due to systematic error in age-determination, this should be reflected in weight-for-age as well as height-for-age.

Figure 18 and Table 9 show the prevalence rates for underweight in 1983 and 1992. For all regions combined, the prevalence increased from 37.3% to 46.9%. This confirms the increase suggested by the stunting results, but is much larger in magnitude. The figure also shows that, in contrast to the stunting results, the prevalence of underweight increased in all eleven regions, and by a significant amount. This is shown more clearly in Figure 19, where it can be seen that the prevalence increased without exception in all regions. The size of the increase ranges from 4 to 17 percentage points, with most regions experiencing an increase of 5 to 10 percentage points.

Figure 20, based on mean weight-for-age Z-scores rather than prevalences, confirms that these results reflect a shift in the entire distribution rather than simply increased variance due to measurement error. In fact, the SD's of weight-for-age are very similar between 1983 and 1992, unlike those for height-for-age which were much higher in 1983. It is worth noting that despite the fact that 1983 survey was conducted 1-2 months earlier than the 1992 survey both of them were conducted during the post-harvest season. Thus, it is unlikely that these results are due to any seasonal influences on weight-for-age.

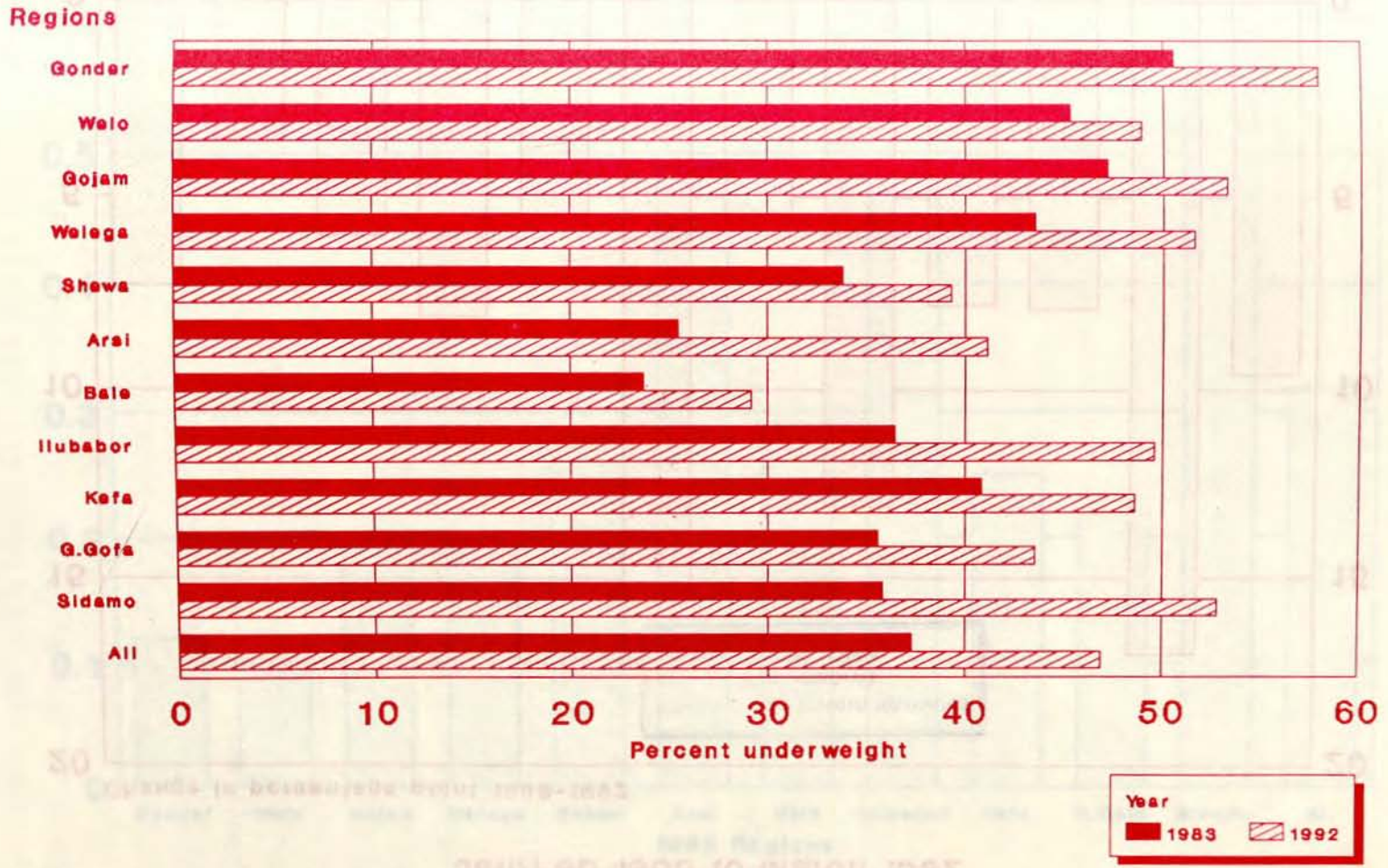
Finally, it is evident that in three regions the results for weight-for-age contradict those shown earlier for height-for-age. Specifically, it is most likely that the large improvement in height-for-age suggested for Gamo Gofa is the result of some type of gross measurement error in that region in 1983, and lesser errors probably occured in Gonder and Welo.

In summary, these two surveys provide convincing evidence that the nutritional status of children is significantly worse in 1992 than it was in 1983. This appears true in all regions examined, with the most notable declines in nutritional status being found in Sidamo, Arsi and Ilubabor.

C. The Distribution of Malnutrition Across Agro-ecological and Socioeconomic Groups

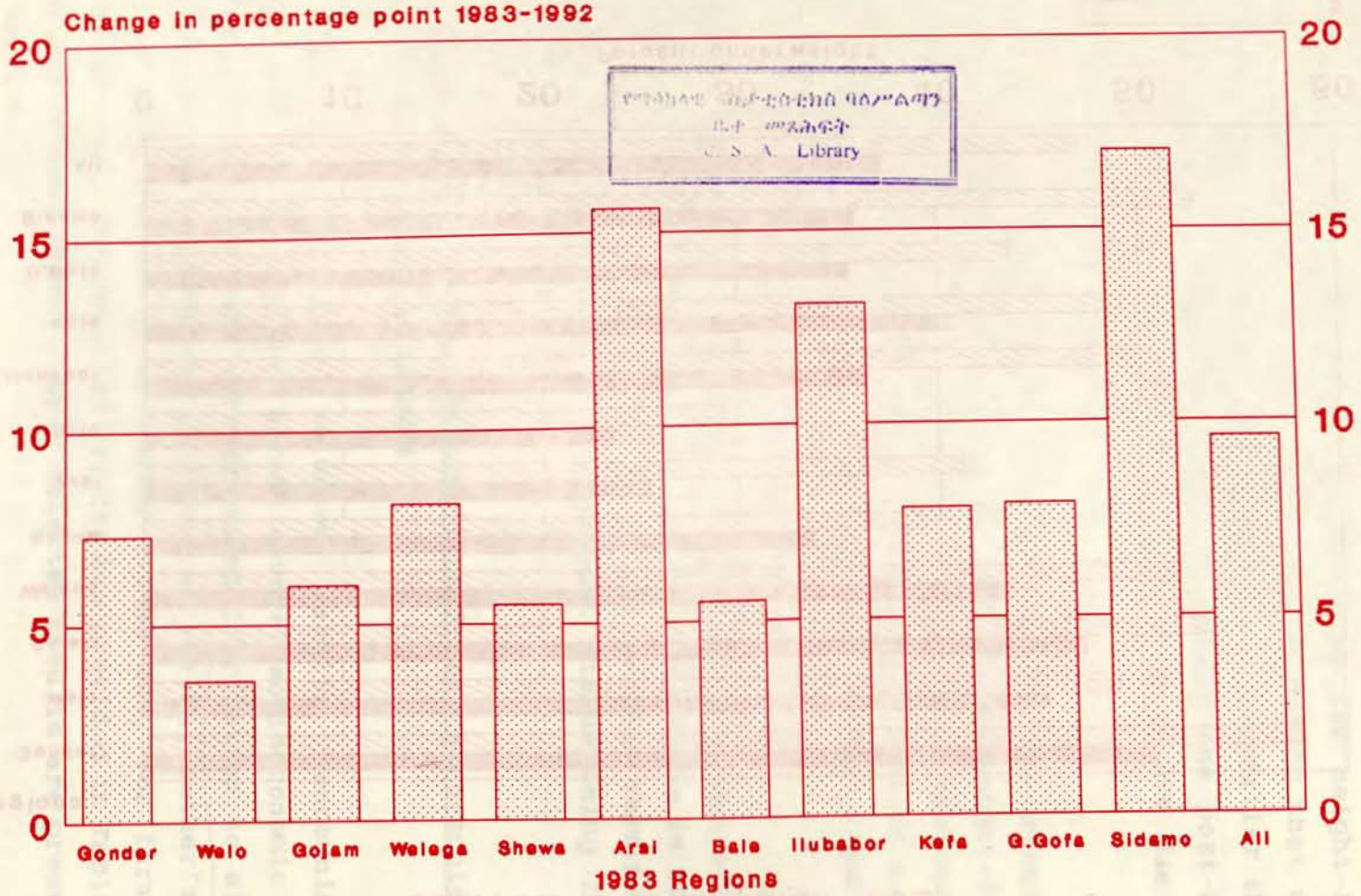
This section highlights selected results concerning the distribution of malnutrition across several socioeconomic groups. As noted earlier, results were produced in relation to altitude, the dominant agro-ecological patterns of the FA, mother's ethnic group, primary source of household income and, for farmers, by cultivated area. The detailed results are provided in Tables 11-23 at the end of this report. Only selected results are presented in this section.

Fig. 18-Levels of Undreweight During Jan/Feb 1982 to March 1992



Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

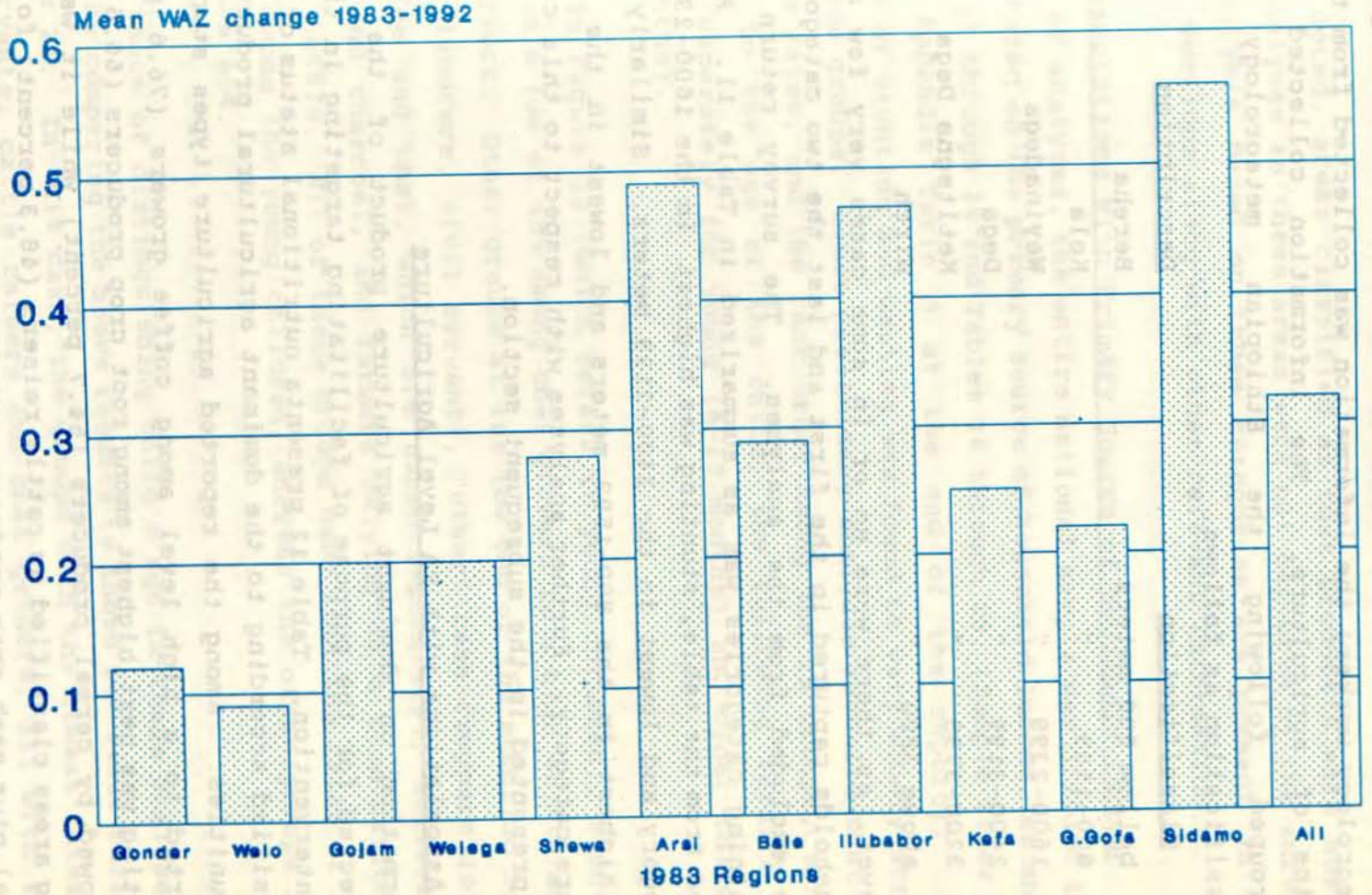
Fig. 19-Change in Underweight Jan/Feb 1983 to March 1992



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Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

Fig. 20-Changes in Mean Weight for Age Jan/Feb 1983 to March 1992



Source: 1983 and 1992 Rural National Nutrition Surveys, (CSA)

1. Association with Altitude

Altitude of the area was collected by inquiring meteorology workers when they are available or agricultural extension agents of the communities. In the absence of agricultural agents (and meteorology worker) the information was collected from the awraja office of agriculture. The information collected was then regrouped following the Ethiopian meteorology agencies classification as follows.

Classification	Description
bellow 800 meters	Bereha
800-1599 "	Kola
1600-2399 "	Weyinadega
2400-3199 "	Dega
3200-3799 "	Ketitegna Dega
above 3800 "	Wirch

However, as there were no or in some cases very few number of households captured in the first and last the two categories they were excluded from the analyses. The survey return on the remaining categories was as summarized in Table 11. As can be noted from the table, stunting was highest in the 1600-2399 meters category and lowest in the 2400-3199 meters. Similarly, wasting was highest in the 800-1599 meters and lowest in the 2400-3199 meters category. Further analyses with respect to this categories are presented in the subsequent section.

2. Associations with FA Level Agriculture

Information on dominant agriculture product of the area was collected for the purpose of facilitating targeting in the course of intervention. Table 12 presents nutritional status of children classified according to the dominant agricultural products of the communities. Among the reported agriculture types stunting was reported to a high level among coffee growers (76.6 percent). Stunting was next highest among root crop producers (66.6 percent) followed by cereal producers (64.7 percent) while it was lowest among areas classified as cattle raisers (48.3 percent) followed by cereal plus cash crop producer. Similarly nutritional wasting was

found to be highest among cattle raisers (11.6 percent) and root crop producers (11.4 percent) while it was lowest among mixed categories classified as 'others', 5.9 percent.

As can be noted, areas classified as chat producers were absent from the analyses as these areas were not captured by the survey. Further analysis based on these categories are present in the subsequent sections along with other relevant information.

3. Associations With Primary Source of Household Income

In one set of analyses, the entire national sample was divided into 15 groups based on the primary source of household income, as shown in Figure 21 through 24 and Tables 16 through 18. (Sample sizes are shown in Appendix Table 9 at the end of the report). The prevalence of stunting and wasting was found to vary widely across these income groups. Since preliminary analysis revealed that the prevalence rates, and the rank order among the 15 groups, varies according to the age of the child, the following results are presented separately for young (6-23 months) and older children (24-59 months).

As shown in Figure 23 (which refers to young children), stunting varies from a low of 45% among chat growers to a high of 71% among cattle raisers. Other groups at the low end of the stunting range are daily laborers, civil servants, "other" cash croppers (other than coffee and chat, which are named separately), sellers of firewood and charcoal, and farmers relying on a combination of roots and cattle. All of these groups have stunting rates of 54% or below among the young children, whereas the other groups have rates above 60%.

The importance of distinguishing child's age in these analyses is revealed by comparing the above results to those for older children in Figure 24. In this case, the groups with the lowest rates are civil servants, cattle raisers and chat growers, all with rates below 49%. The groups with the highest rates are "other" cash

croppers, coffee growers, daily laborers, fuel sellers, cereal/root growers and craftmakers, all with rates above 68%. It will be noted that about half of these groups were at the opposite end of the range in the case of young childlren (e.g. cash croppers, daily laborers and fuel sellers). These results, while appearing contradictory on the surface, may simply reflect differences in household dynamics as they affect children. Infants and young children are highly dependent upon caretakers for maintaining good health and nutritional status, such that any economic activities or circumstances which interfere with child care may disproportionately affect young children. By contrast, older children are typically expected to eat the adult diet and display greater independence, and may be more greatly affected by household food supply, income, adult meal patterns and competition with older siblings when food is limited. These may be considered working hypotheses to help analyze the possible causes for variation in stunting across these groups. They are likely to be reflection of breastfeeding and weaning practices by the groups. Those groups with low malnutrition among the infants might well start weaning earlier, while on the other hand groups with better nourished older children may be better at giving supplement food to the children (relate to section iv). The results pertaining to wasting in these figures provide additional insights into the nutritional conditions associated with these income sources. Among young children the most wasted groups are chat growers and cattle raisers, despite the fact that these two groups are at the opposite end of the stunting range. Thus, cattle raisers have high rates of stunting and wasting and deserve closer investigation. Chat growers, however, had exceptional levels of wasting (21%), at least at the time of the survey, and the lowest level of stunting among the 15 groups. This may reflect some seasonal influences on nutritional status among chat growers. It should be noted, however, that chat growers represent a very small group in the present sample and in the population at large, although they may be found in high concentrations in certain areas.

Among older children, wasting occurs at much lower rates and does not display the same marked variation across the income sources. The highest rates are found among coffee growers (12%, who also have high stunting rates of 73%) and root growers (10.3%). The lowest rates are found among civil servants, cattle raisers and chat growers, all with rates below 6%. The low rates among the older children of chat growers is in contrast to the very high rates among the younger children and provides additional support for the notion that there may be caretaking problems affecting young children in this group.

4. Household Agriculture and Cultivated Area

In light of the importance of agriculture as a source of income for rural households, some additional analysis was undertaken in agricultural households, stratifying by size of cultivated area. The results provide some more provocative insights and are shown in Table 19. In general, among young children there is little or no assocation between stunting or wasting and size of cultivated area. There is a weak association between stunting and size of cultivated area among cereal growers, but there is no clear direction to the association. The notable exception is among coffee growers, where the stunting rate rises from 57% among small-scale producers to 74% among larger scale producers.

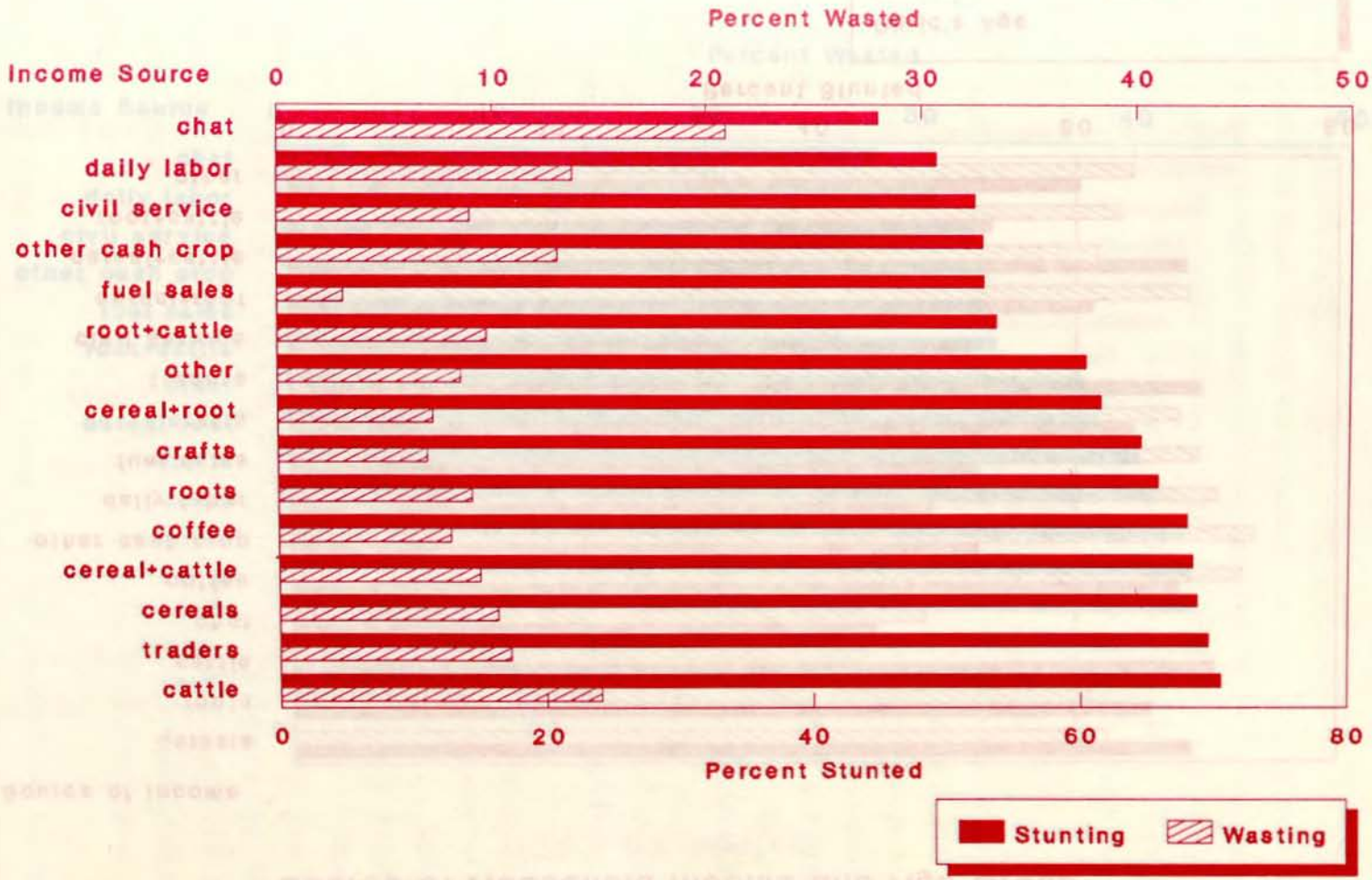
Among older children, by contrast, there are several strong associations between size of cultivated area and stunting or wasting. Stunting decreases significantly as cultivated area increases, among those growing cereals, cereal+roots and cereals+cattle. Similarly, wasting decreases as the cultivated area increases for most groups. The notable exception here is among coffee growers, among whom wasting is strongly elevated among those in the highest cultivated area class. There is a suggestion of similar trends in stunting among coffee growers, but this does not reach statistical significance.

Thus, while the present results should be considered ver preliminary, they confirm that malnutrition is greater among small scale farmers in many different farming systems, and they sugges that the conditions in cash cropping households and communitie might deserve closer investigation.

The strong association found between size of cultivated area an nutritional status in the above analysis stimulated more detaile analysis stratifying by region. This was made possible by the fac that cereal growers represent the overwhelming majority of th rural population and the sample sizes in the survey ar correspondingly large. The rationale for stratifying by region i two-fold. First, it provides some assurance that the associatio detected in the simple analysis (Table 19) is not simply due t confounding by region. Second, it acknowledges the divers settings and conditions under which cereals are grown, with th possibility that the linkages to child nutrition may also vary The analyses were restricted to older children (24-59 months) afte first confirming (with analysis of variance) that there is littl or no association with cultivated area among younger children.

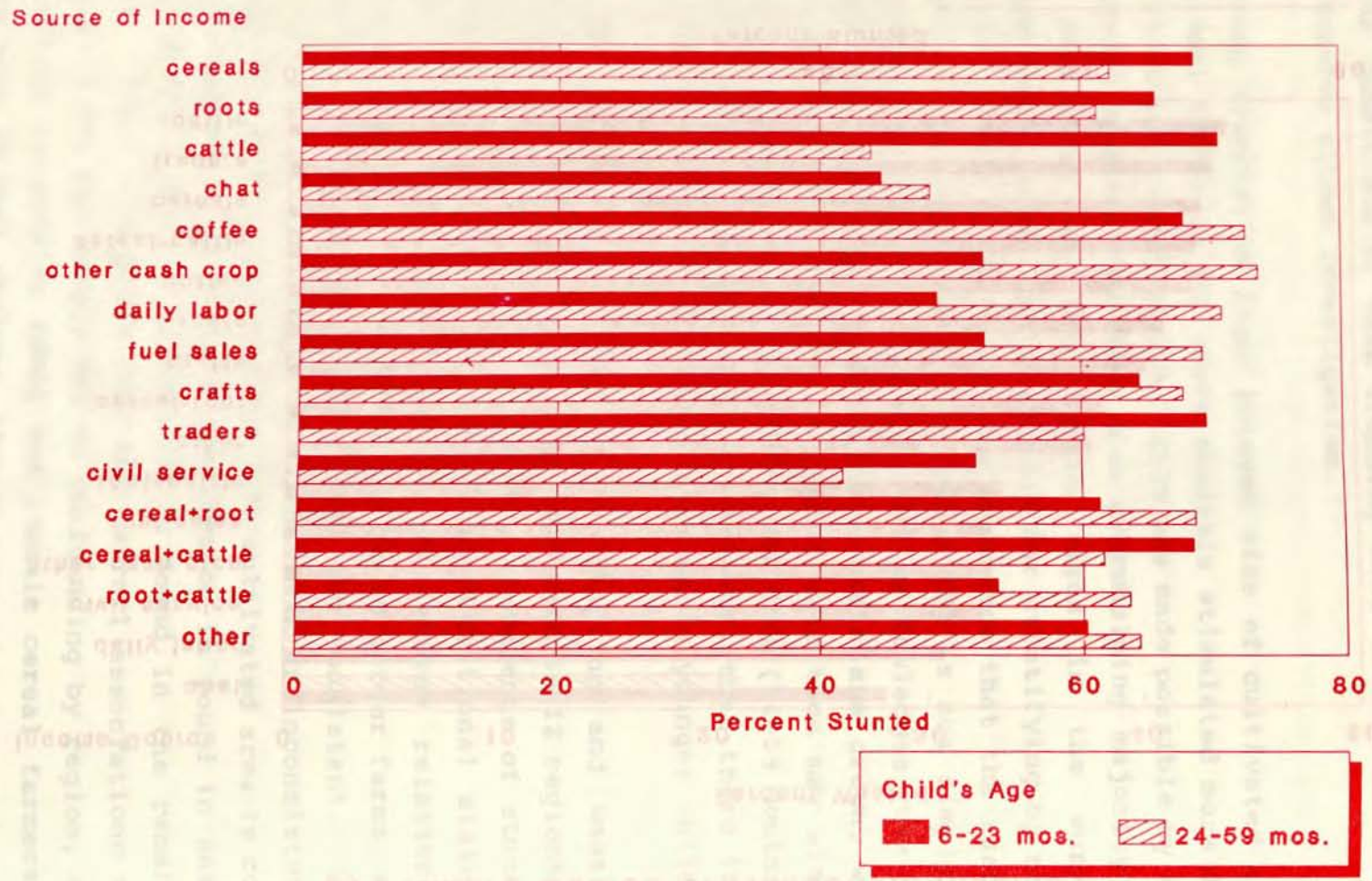
Table 20 presents the results for stunting and wasting, b cultivated area and region. It was confirmed in 12 regions that a the size of cultivated area increases, prevalence of stunting wa decreasing, which means improvement in nutritional status. Tw regions (Kefa and Borena) suggest an inverse relationship t nutritional status i.e., higher stunting on larger farms, with th Kefa result being particularly strong and consistent. In eigh other regions the association is either weak or inconsistent. Fo wasting, the positive association with cultivated area is confirme in eight regions. An positve association is found in one regio (Borena again), and no assocation is found in the remaining 1 regions. Thus, it appears that the overall associations reporte in Table 19 are not simply due to confounding by region, and tha malnutrition is greater among small-scale cereal farmers. Thi appears true in most regions, though exceptions do exist. It i

Fig.21 Prevalence of Stunting & Wasting by Primary Source of Household Income



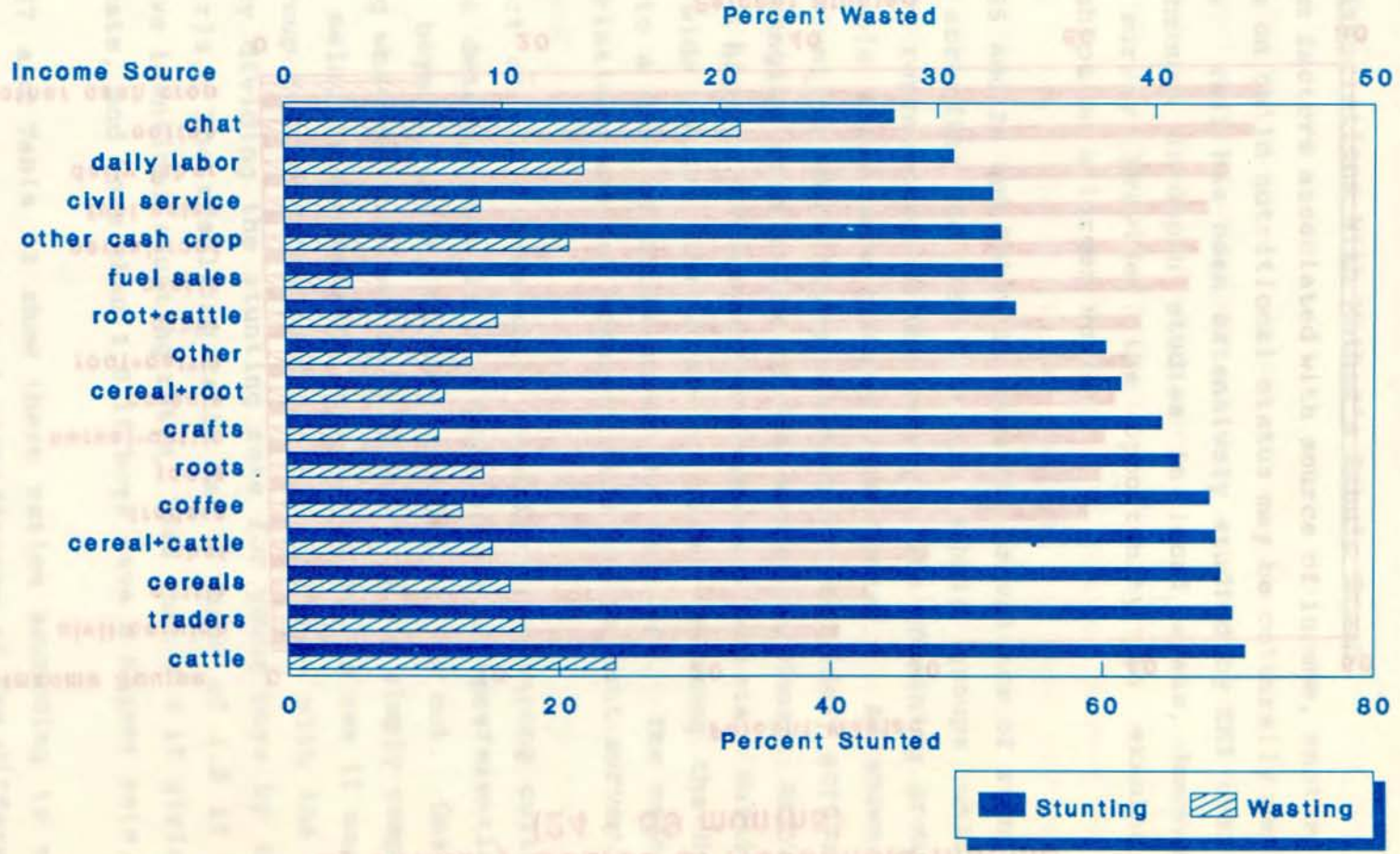
Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 22-Prevalence of Stunting by Source of Household Income and Age Group



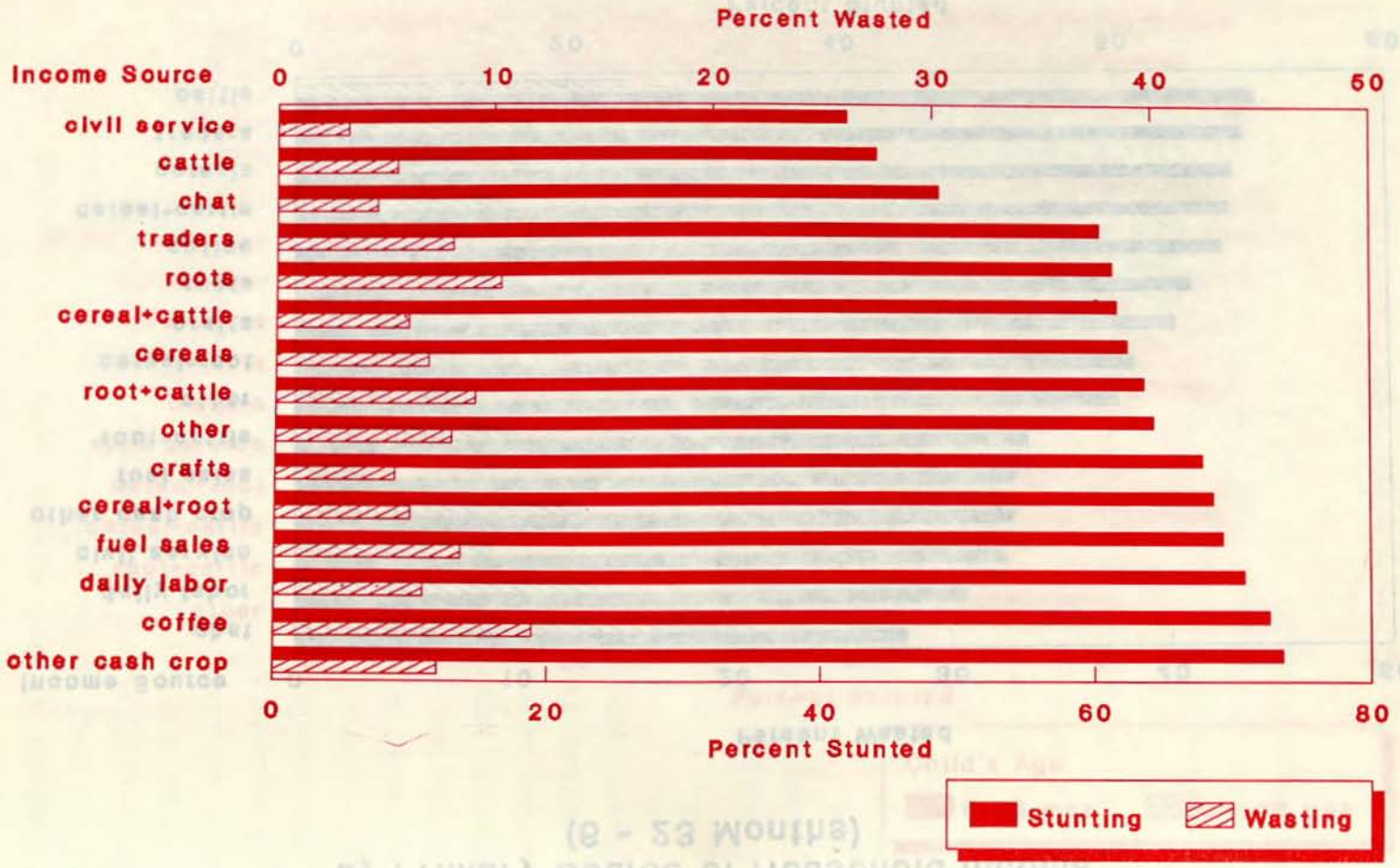
Source: 1992 Rural National Nutrition Survey, (CSA)

Fig.23-Prevalence of Stunting & Wasting by Primary Source of Household Income (6 - 23 Months)



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 24-Prevalence of Stunting & Wasting by Primary Source of Household Income (24 - 59 months)



Source: 1992 Rural National Nutrition Survey, (CSA)

unclear whether the exceptions reflect the absence of a relationship, or simply the influence of additional variables that have not been controlled in this analysis.

5. Associations With Mother's Ethnic Group

Apart from factors associated with source of income, another potent influence on child nutritional status may be culturally determined behaviors. This has been extensively studied by ENI over recent years, through in-depth studies in local areas, however, the present survey provides the opportunity to examine these relationships on a larger scale.

Figures 25 and 26 and Table 21 show the prevalence of stunting and wasting according to 18 distinct ethnic groups which were adequately represented in the survey. The remaining groups with small sample sizes were grouped into "other." As shown in the figure, stunting among young children varies widely across ethnic groups, ranging from a low of 55% among the Konso, Ari/Ara and Gamo, to a high of 77% among the Kimant and Kembata. Wasting also shows a wide range, from a low of under 5% among the Kefa and Borena, to a high of 18.6% among the Tigraway. The reasons for these variations are not apparent from the present survey.

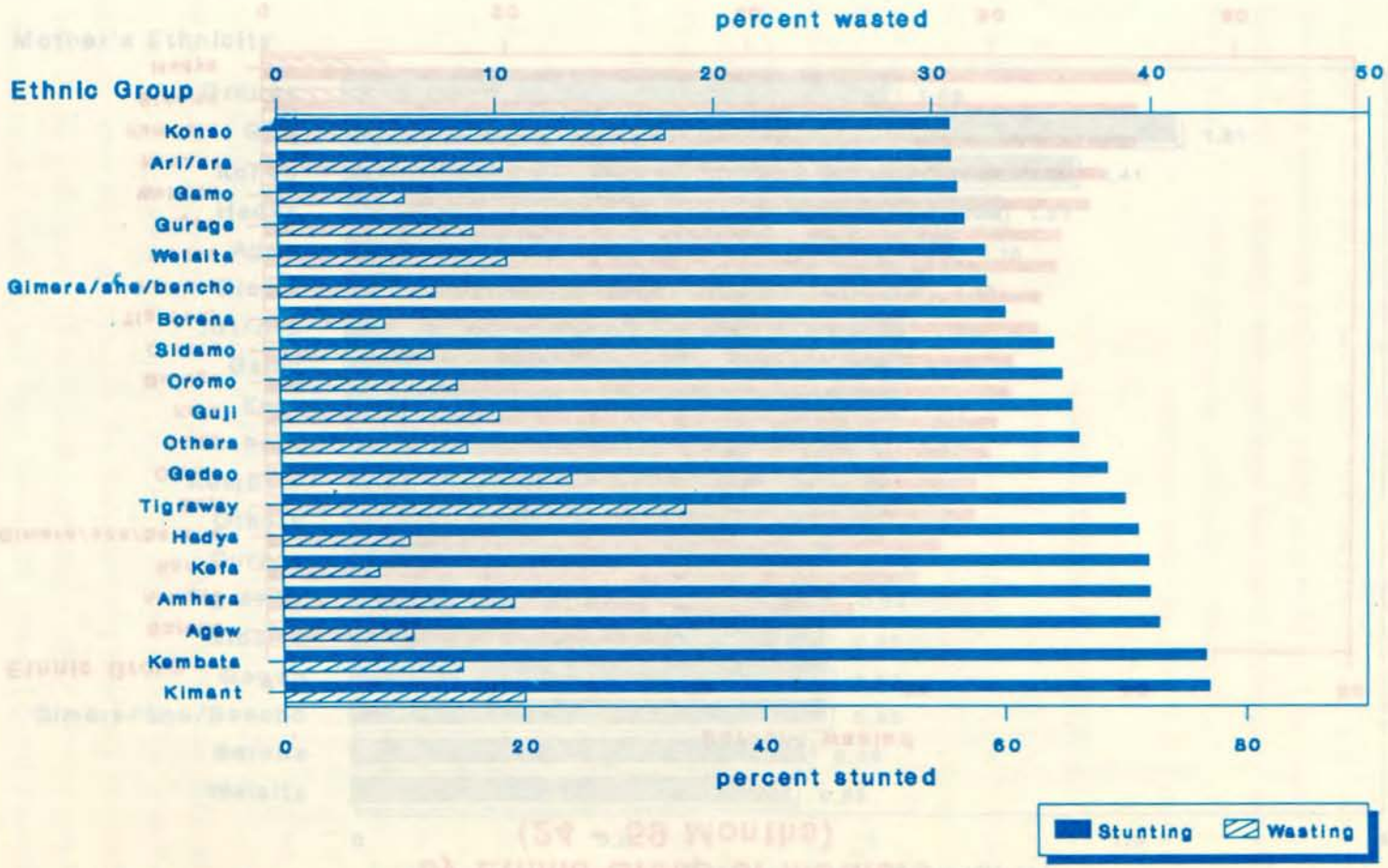
One aspect of child care which sometimes has strong cultural or religious determinants is the possibility of preferential care given to boys or girls, whether consciously or not. One way of assessing whether this may be a problem is to simply compare the rates of malnutrition between boys and girls, to see if one or the other group has elevated rates. This was done with the present sample by dividing the stunting rate for young boys by that for young girls. The resulting ratio has a value of 1.0 if the two sexes have identical stunting rates, less than 1.0 if girls have a higher rate, and more than 1.0 if boys have a higher rate.

Figure 27 and Table 22 show these ratios according to mother's ethnic group. The statistical significance of the difference was

tested using a simple Chi-Square test within each ethnic group. The figure shows that several groups have elevated ratios (indicating higher stunting rates among boys). Four of these are statistically significant, taking into account the size of the ratio and the sample size for that ethnic group. These are the Gujji (ratio=1.61), the Hadya (1.27), the Oromo (1.13) and the Amhara (1.06). The ratio in the latter two groups is only modestly elevated in absolute terms, and the statistical significance arises primarily due to the large sample sizes for these two groups. The Hadya and the Gujji display marked differences in the stunting rates for boys and girls, but these groups have very small sample sizes and the result is probably the result of sampling variation. As shown in Table 22, the elevated ratios are not confirmed among older children in any of these ethnic groups. Thus, there does not appear to be any evidence of sex preference in child care based on this approach in this assessment.

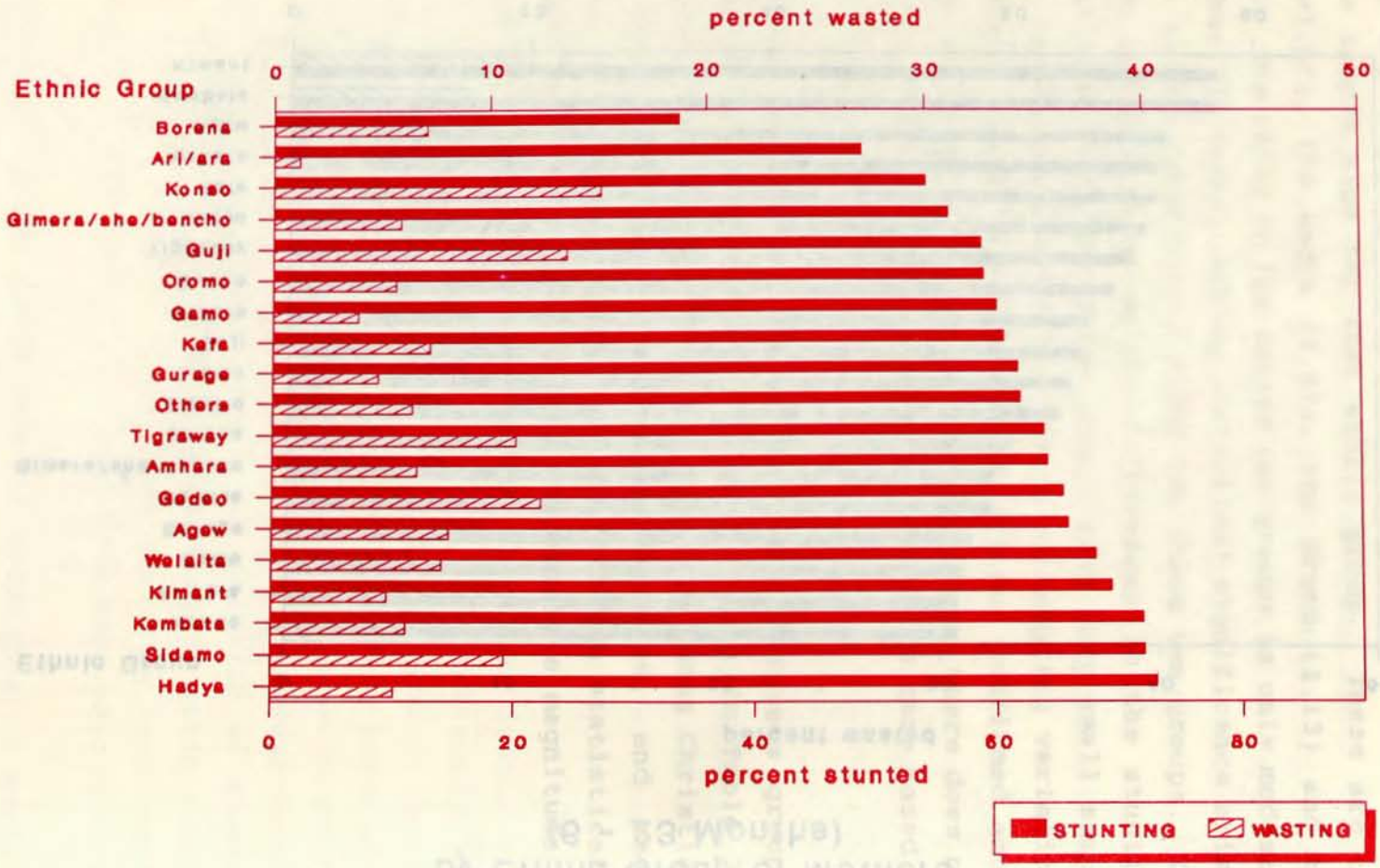
A similar analysis was conducted within three religious groups: Christian, Moslem and Pagan/Atheist. The results in Table 23, revealed ratios that were significantly elevated among Christians (1.05) and Moslems (1.10) for younger children, and among Pagan/Atheists for older children (1.21). Although statistically significant due to large sample sizes, the absolute magnitude of these ratios is not particularly worrying.

Fig.25-Prevalence of Stunting & Wasting by Ethnic Group of Mothers (6 - 23 Months)



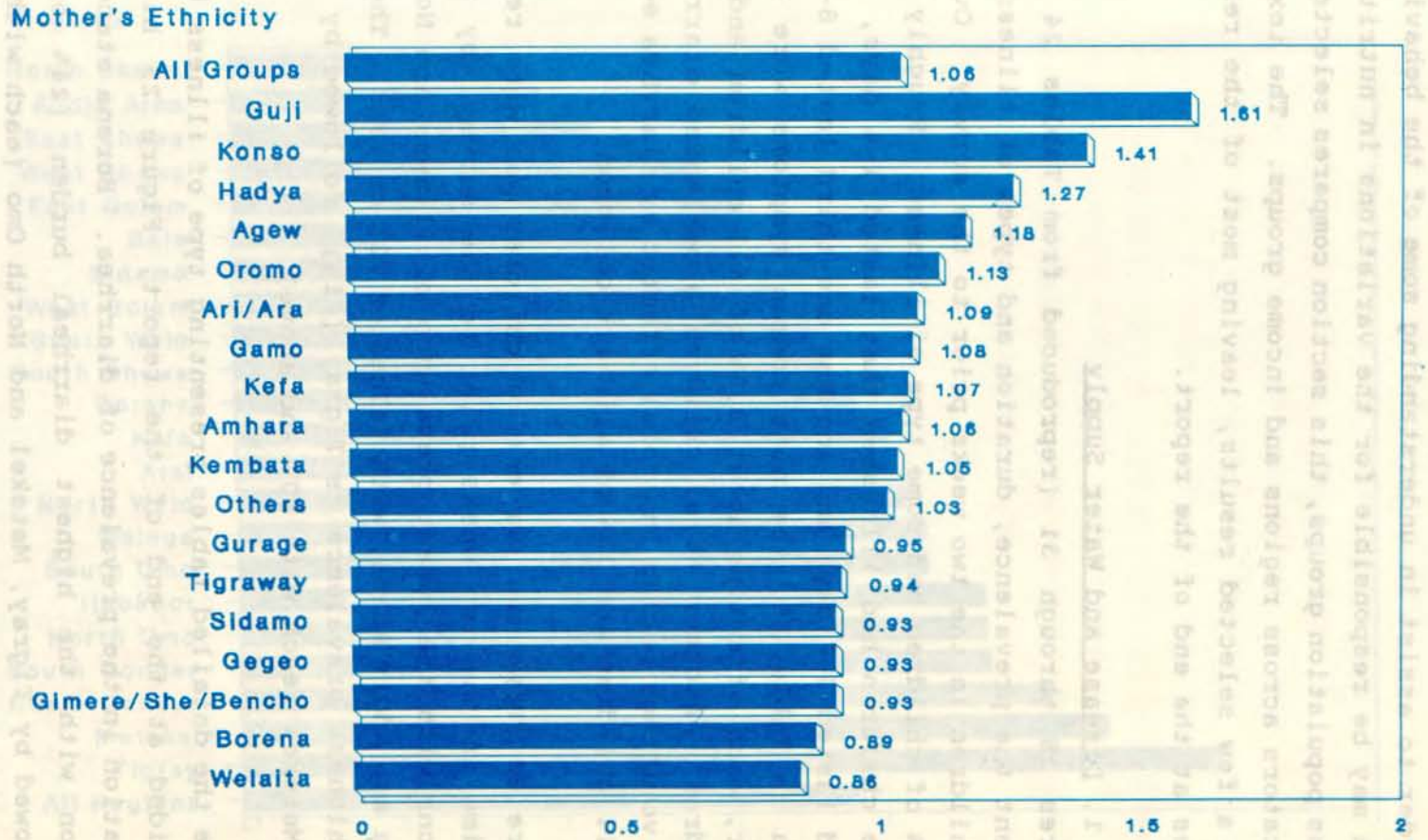
Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 26-Prevalence of Stunting & Wasting by Ethnic Group of Mothers (24 - 59 Months)



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 27-RELATIVE RISK OF STUNTING BY ETHNIC GROUP OF MOTHERS (6 - 23 Months)



Source: 1992 Rural National Nutrition Survey, (CSA)

D. The Distribution of Related Indicators Across Regions and Source of Income.

In order to assist in understanding some of the behavioral factors which may be responsible for the variations in nutritional status across population groups, this section compares selected behavioral indicators across regions and income groups. The text highlights only a few selected results, leaving most of the results in the Tables at the end of the report.

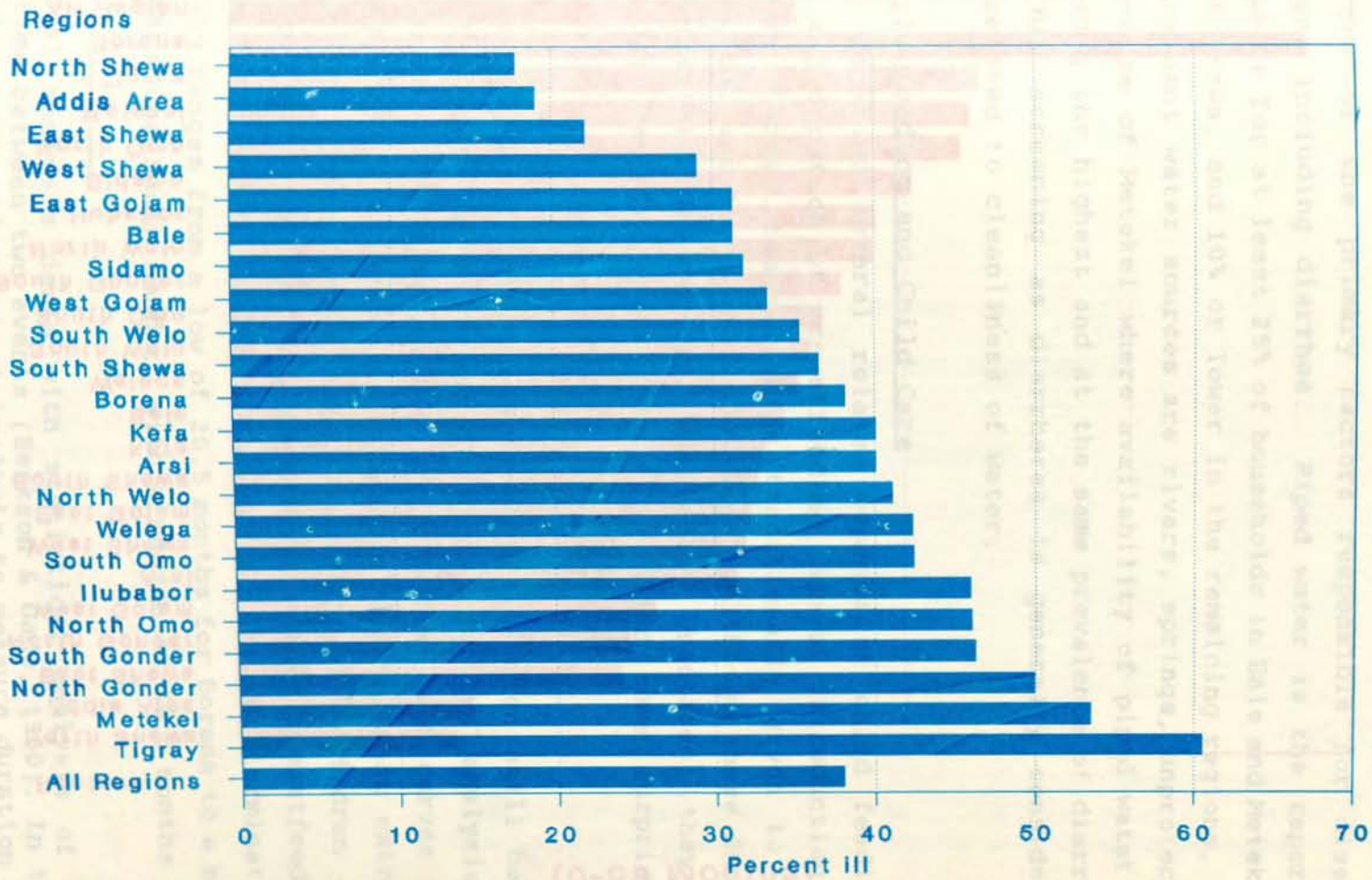
1. Disease and Water Supply

Figures 28 through 31 (reproduced from Tables 24 through 28) present the prevalence, duration and types of illness experienced by children in the two weeks prior to the survey. Over all ages, 38.2% of children had some type of illness. Roughly one-third of these children had illnesses that lasted 1-4 days, another one-third lasted 3-7 days and another one-third lasted 8-14 days. As shown in Table 25, the most common symptoms were diarrhea and fever, each affecting about 8.5% of all children and 22% of sick children. Another 4% of children experienced diarrhea together with vomiting, making the total affected by diarrhea equal to 12.5% of all children and 33% of all sick children.

Figure 28 shows the percent of children who were reportedly ill anytime in the two weeks prior to the survey, by region. The regions with the lowest prevalence of illness are North and East Shewa and Addis Ababa, with values of 22% or less. The region with the highest prevalence is Tigray (61%), followed by North Gonder and Metekel (each with 50% and above).

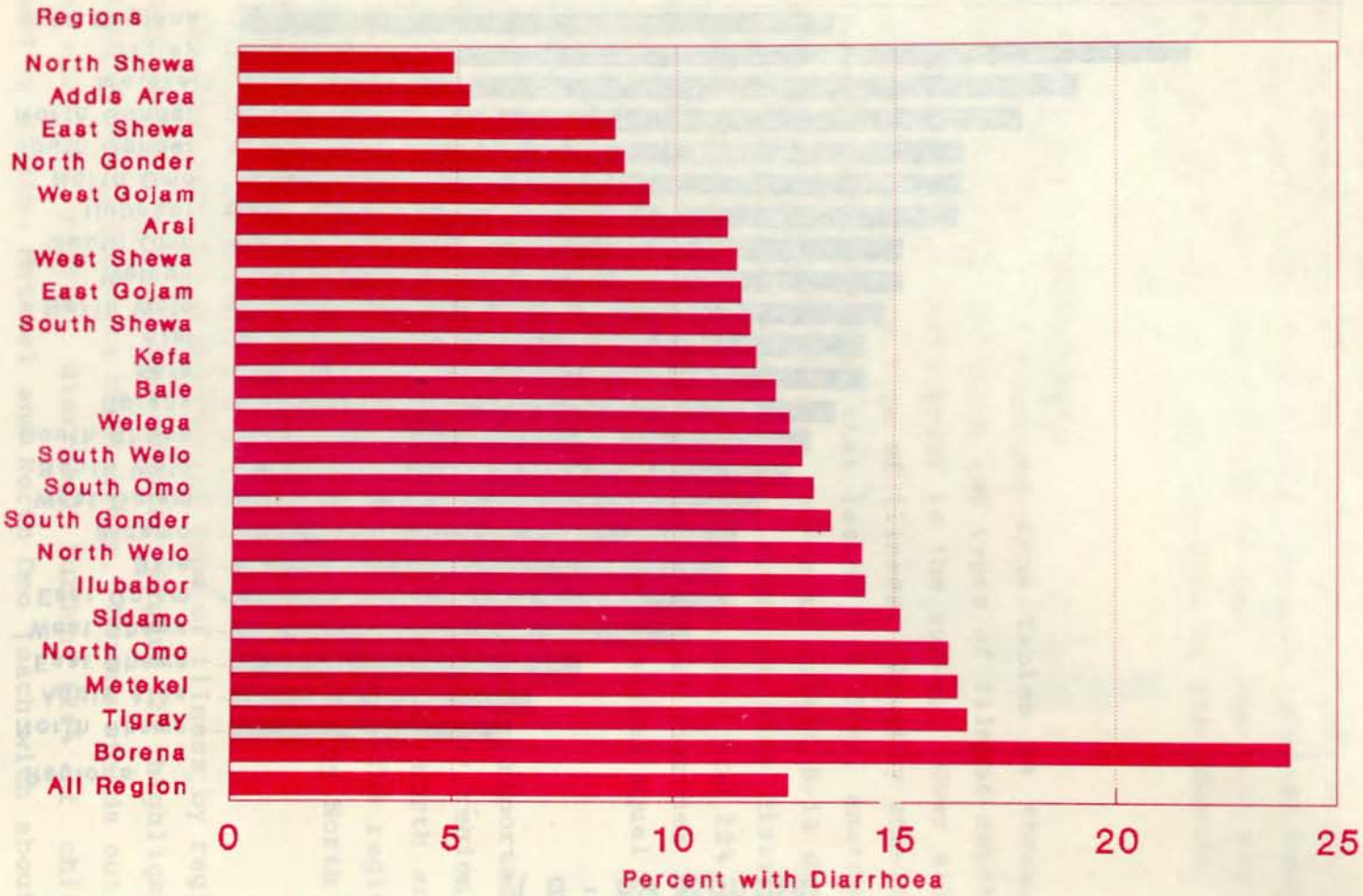
While the detailed tables presenting type of illness by region are provided at the end of the report, Figure 29 highlights the variation in the prevalence of diarrhea. Borena stands out as the region with the highest diarrheal burden (24% of children), followed by Tigray, Metekel and North Omo (each with about 16%).

Fig. 28-Percent Ill in Prior Two Weeks (6 - 59 Months)



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 29-Percent with Diarrhoea by Region (0-59 Months)



Source: 1992 Rural National Nutrition Survey, (CSA)

The lowest diarrheal burden is found in North Shewa and Addis Ababa (about 5%).

Figures 30 and 31 and Tables 29 and 30 highlight the regional water supplies, one of the primary factors responsible for disease transmission, including diarrhea. Piped water is the reported source of water for at least 25% of households in Bale and Metekel, 17% in East Shewa, and 10% or lower in the remaining regions. By far, the dominant water sources are rivers, springs, unprotected wells. The case of Metekel where availability of piped water is reported among the highest and at the same prevalence of diarrhea needs further screening as diarrherea is generally considered inversely related to cleanliness of water.

2. Child Feeding and Child Care

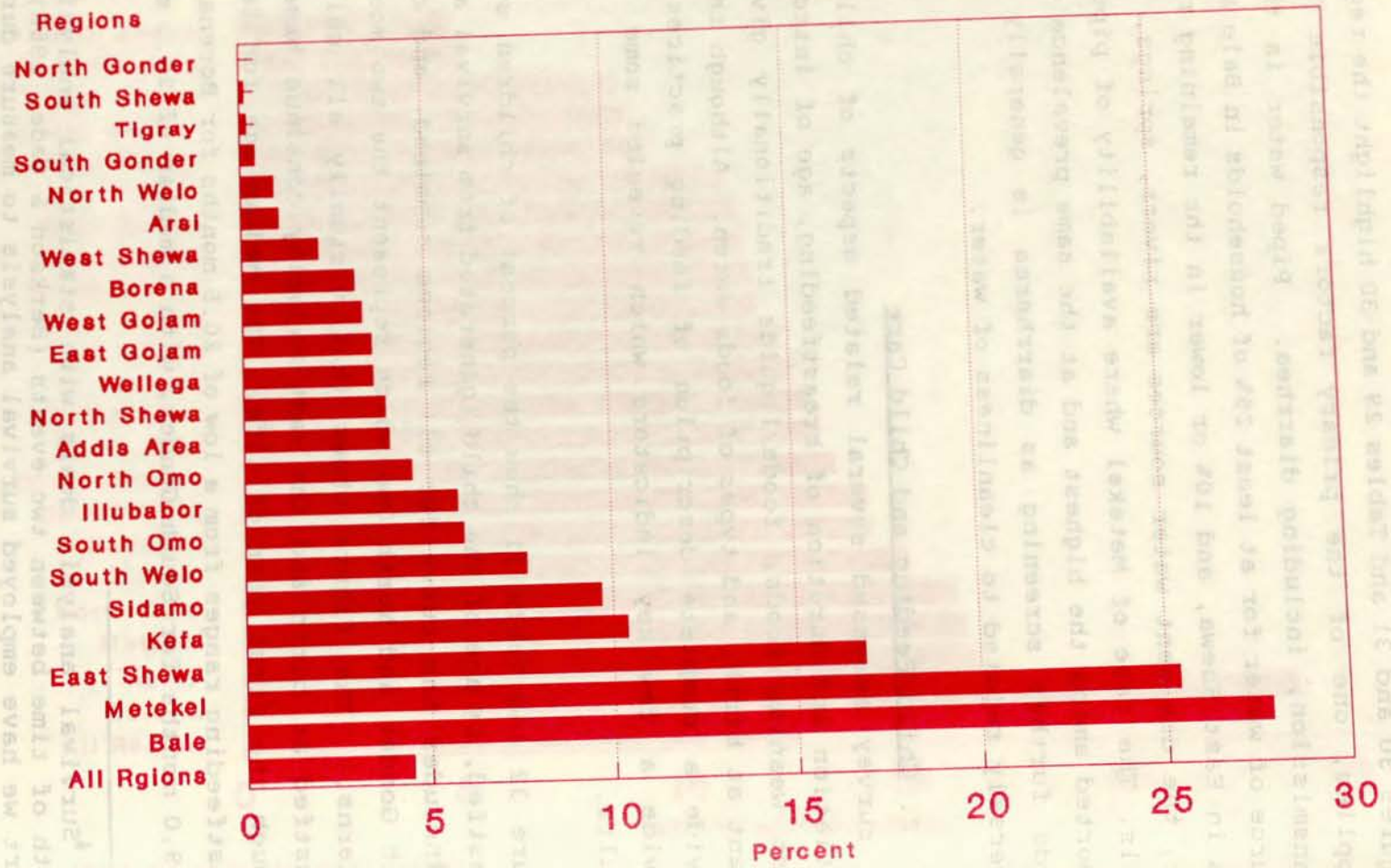
The survey assessed several related aspects of child feeding: initiation and duration of breastfeeding, age of introduction of first weaning foods, foods/liquids traditionally given to the infant at birth, and types of foods eaten. Although these do not provide a complete description of feeding practices, they do provide a few key indicators which revealed some surprising results.

Figure 32 and Table 31 show the percent of children still being breastfed, by age of the child (generated from survival analysis[6]). It includes the curve for all regions combined, and curves for South Gonder and North Omo which represent the two most extreme patterns. The figure shows that virtually all children are breastfed at birth and the vast majority continue breastfeeding through the first year of life. The median age for terminating breastfeeding ranges from a low of 20.5 months for Borena to a high of 29.0 months for South Gonder, with a median of 25.3 months for

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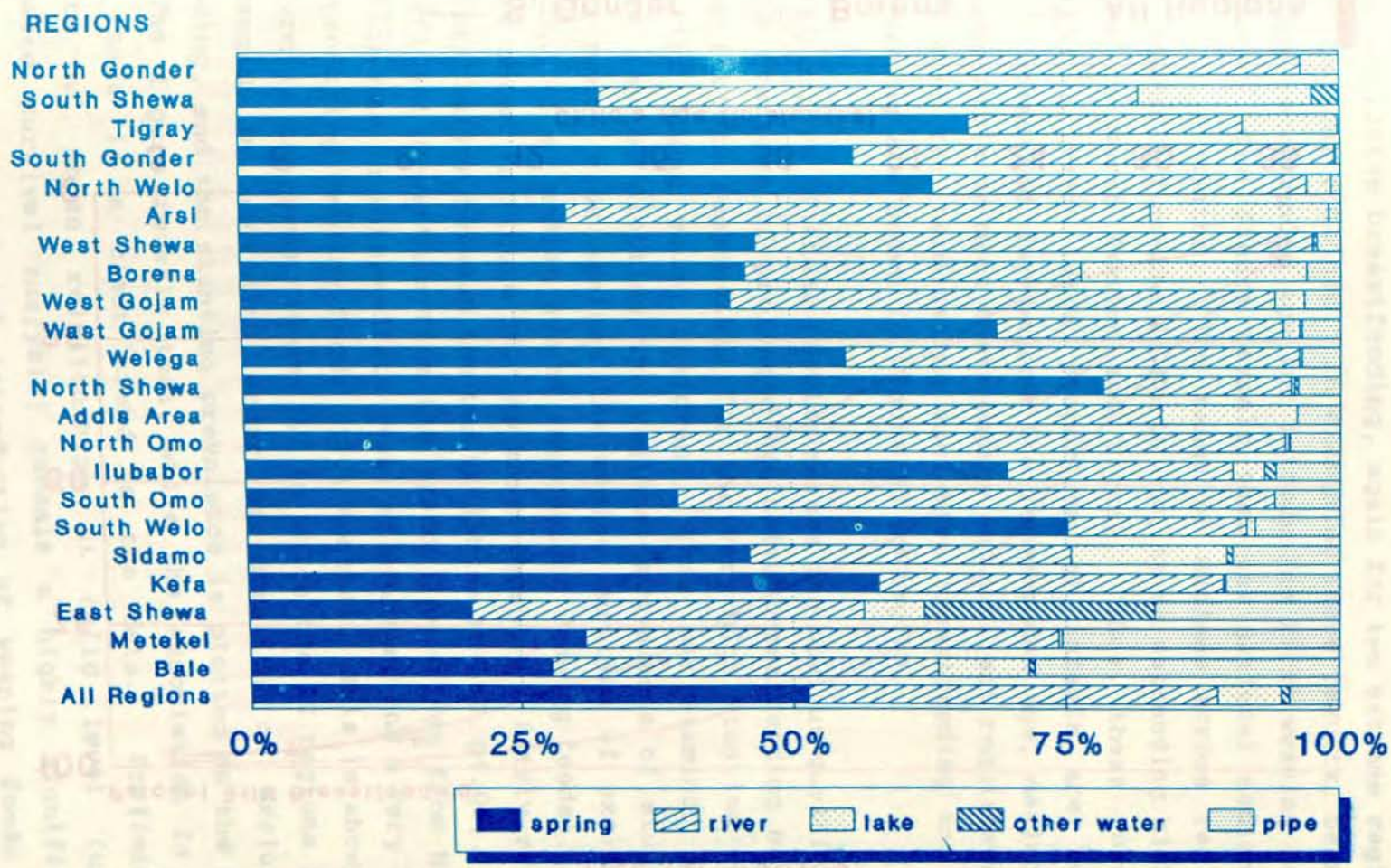
[6]Survival analysis deals with statistical analysis of the length of time between two events (Berkson & Gade, 1950). In this report we have employed survival analysis to measure duration and termination status of breast-feeding at different ages.

Fig. 30-Households with Pipe Water Supply by Region



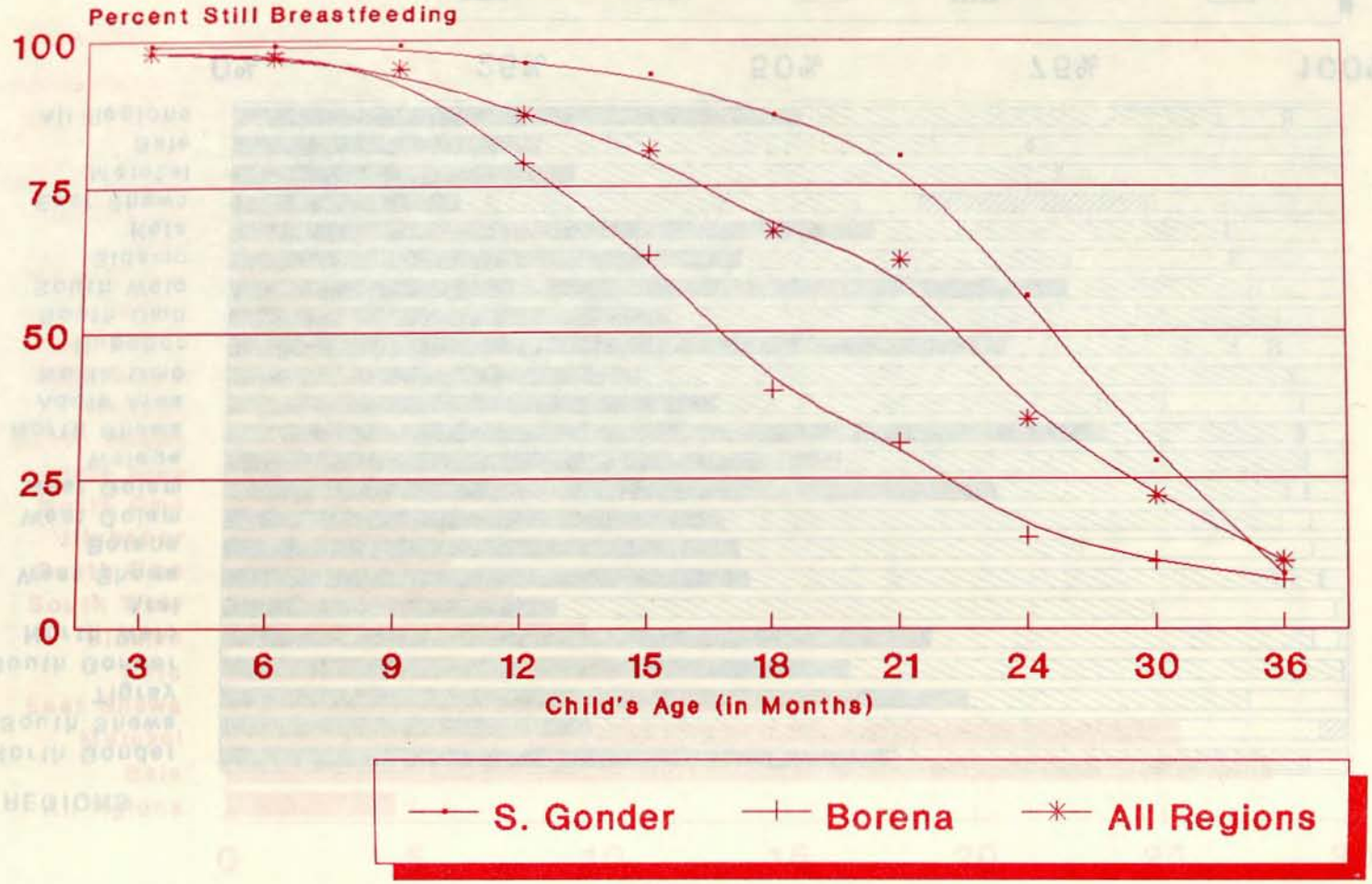
Source: 1992 Rural National Nutrition Survey. (CSA)

Fig. 31-Households by Water Supply and Region



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 32-Percent Still Breastfeeding by Age (in Months)

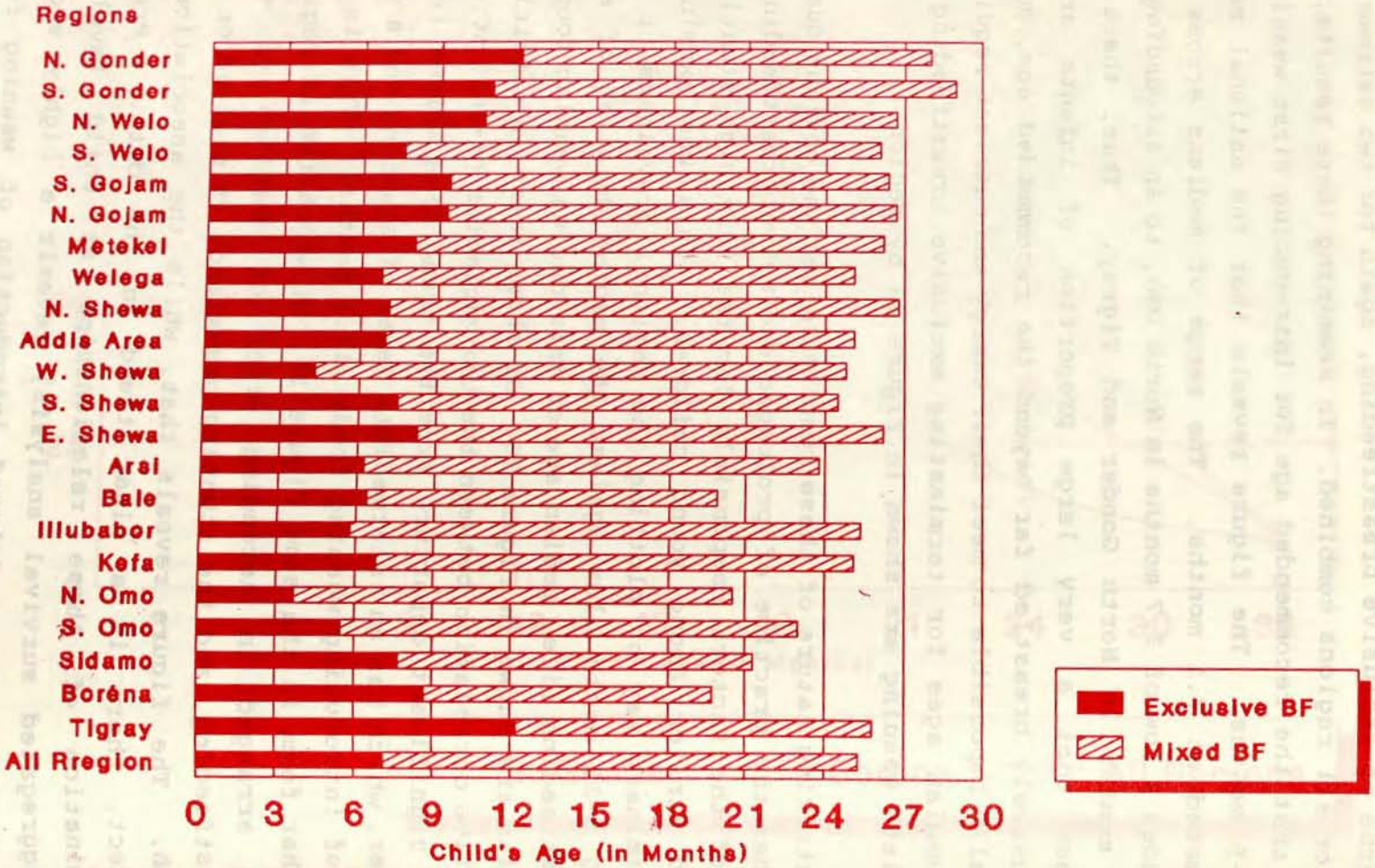


Source: 1992 Rural National Nutriti
Survey, (CSA)

all regions combined. Comparable figures for individual regions are provided in Table 31 and 32 at the end of the report.
In contrast to these encouraging results, Figure 34 shows the patterns of exclusive breastfeeding, again for two extreme regions and for all regions combined. In examining these results, bear in mind that the recommended age for introducing first weaning foods is 4-6 months. The figure reveals that the national median is estimated at 7.1 months. The range of medians across regions includes a low of 3.7 months in North Omo, to an astounding high of 12.1 months in North Gonder and Tigray. Thus, these results suggest that a very large proportion of infants are being exclusively breastfed far beyond the recommended age, making it vitually impossible to meet their energy and nutrient requirements. The median ages for terminating exclusive breastfeeding and for complete weaning are shown in Figure 33 by region.

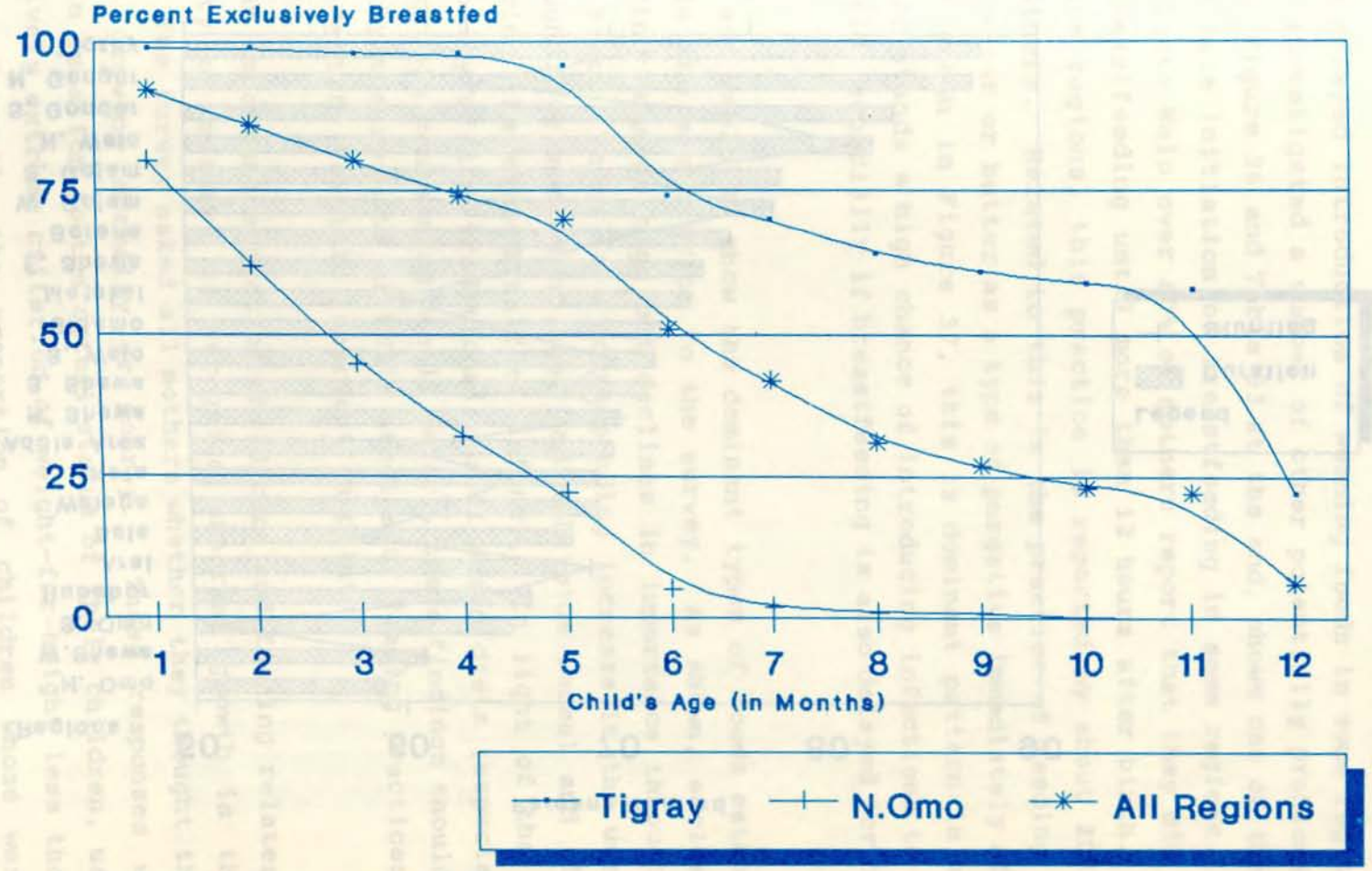
The striking nature of these results raises the obvious question of whether the practice of prolonged exclusive breastfeeding may be one of the factors responsible for the very high stunting rates noted earlier among young children. This was examined in a preliminary way by plotting the regional prevalence of stunting among 6-23 month olds against the median duration of exclusive breastfeeding (i.e. median age of introducing weaning foods). The results are shown in Figure 35. As shown there is a fairly strong positive correlation between the two variables ($r=.60$, $p<.05$). The only significant departure from the trend line arises from North Gonder, which has an intermediate level of stunting and a very late age of introducing weaning foods (12.1 months). This is shown in another form in the same Figure 35, in which the 22 regions have been arranged in ascending order of duration of exclusive breastfeeding, and the stunting prevalence is plotted on the same graph. The figure reveals that, while the association is not perfect, there is a clear trend in the data. Preliminary examination of these relationships at child level (using disaggregated survival analysis) reveals a highly significant association between delayed introduction of weaning foods and

Fig. 33-Duration of Exclusive and Supplemented Breastfeeding: Median by Region



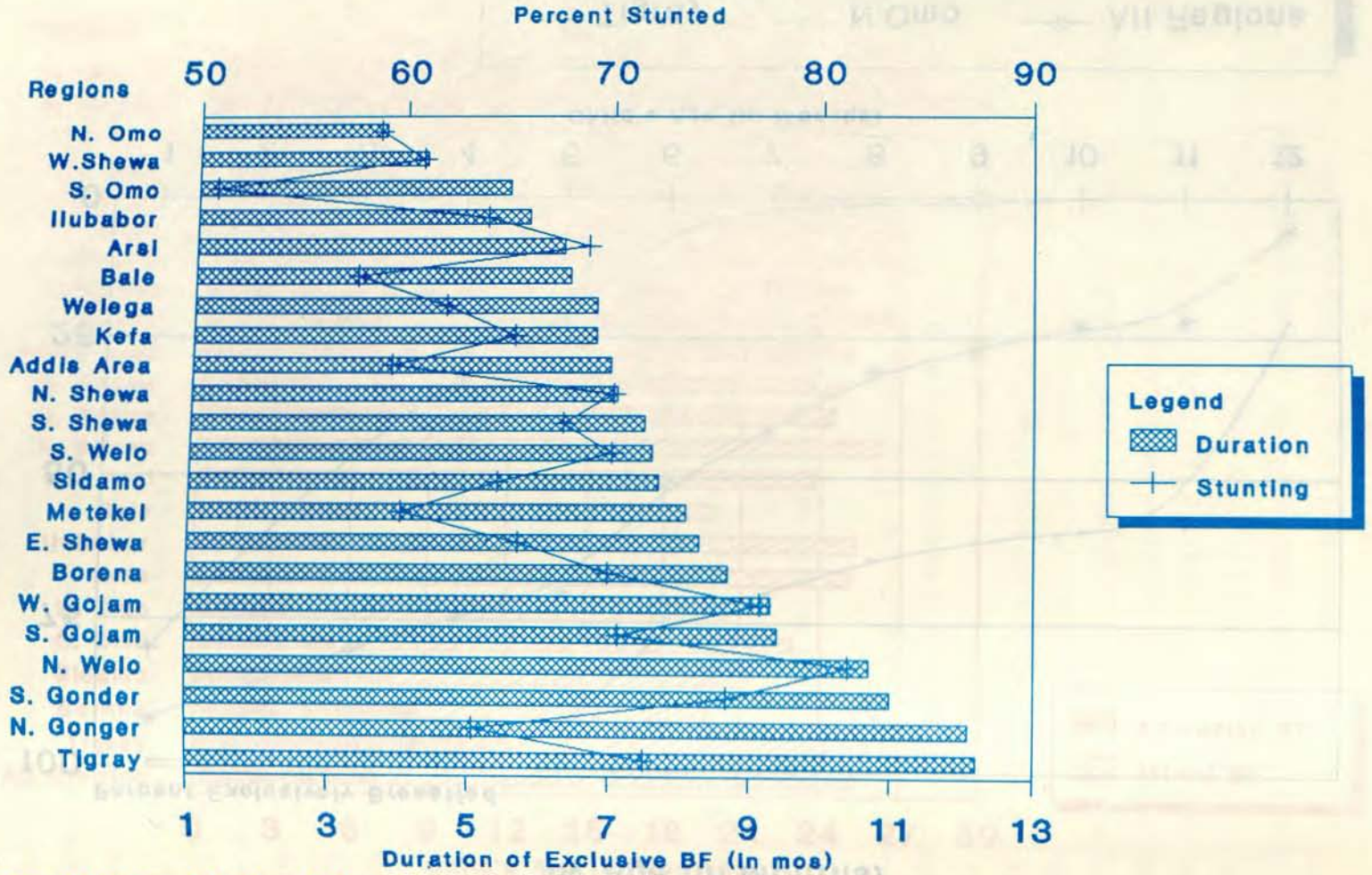
Source: 1992 Rural National Nutrition Survey. (CSA)

Fig. 34-Children Exclusively Breastfed by Age (in Months)



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 35-Stunting and Exclusive Breast-Feeding (Regional Level Aggregation)



Source: 1992 Rural National Nutrition Survey. (CSA)

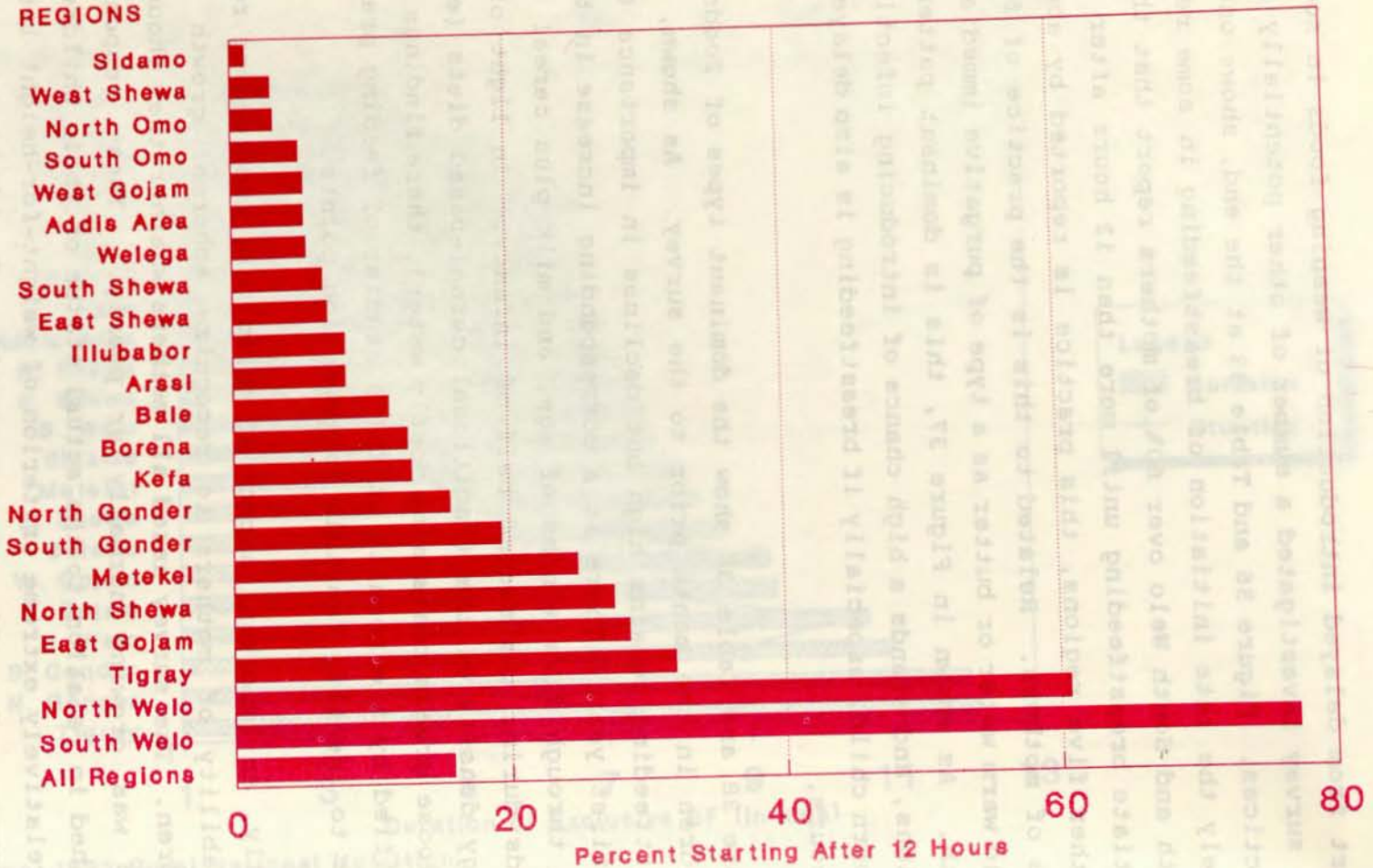
stunting. These results require confirmation through knowledgeable individuals at ENI and in the affected regions, and they suggest some possible areas for immediate intervention.

Apart from delayed introduction of weaning foods in some regions, the survey investigated a number of other potentially problematic practices. Figure 36 and Table 33 at the end, shows one of these, namely the late initiation of breastfeeding in some regions. In North and South Welo over 60% of mothers report that they did not initiate breastfeeding until more than 12 hours after birth. In another five regions, this practice is reported by about 20% or more of mothers. Related to this is the practice of feeding the child warm water or butter as a type of purgative immediately after birth. As shown in Figure 37, this is dominant pattern in most regions, and stands a high chance of introducing infections to the newborn child, especially if breastfeeding is also delayed for over 12 hours.

Figure 38 and Table 39 show the dominant types of foods eaten by children in the month prior to the survey. As shown, exclusive breastfeeding remains high but declines in importance throughout the first year. There is a corresponding increase in the use of milk through five months of age, and milk plus cereal and other solids during the second half of infancy. In light of the low energy density of the traditional cereal-based diets (especially the loose gruels containing mostly water), these findings should be amplified by the results of ENI's studies of feeding practices in order to identify feasible intervention points.

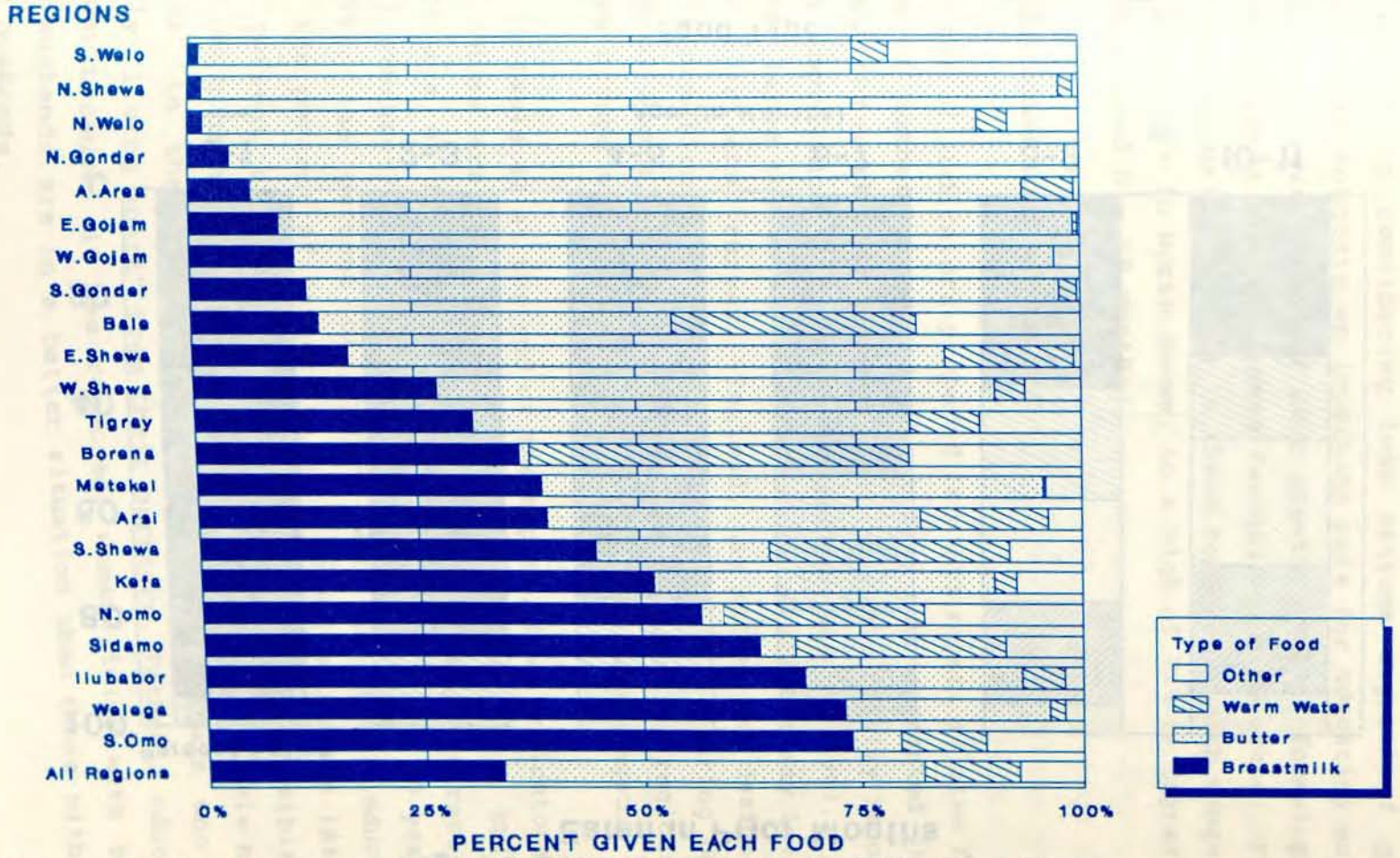
Finally, an important aspect of child care and feeding relates to the ability of mothers to recognize abnormal growth in their children. The survey asked all mothers whether they thought their child was growing normally or poorly. These responses were examined in relation to the actual status of their children, using the relatively extreme criterion of weight-for-height less than -2Z-scores. Overall, the proportion of children whose wasted

Fig.36-Children Initiating Breastfeeding After 12 Hours of Birth



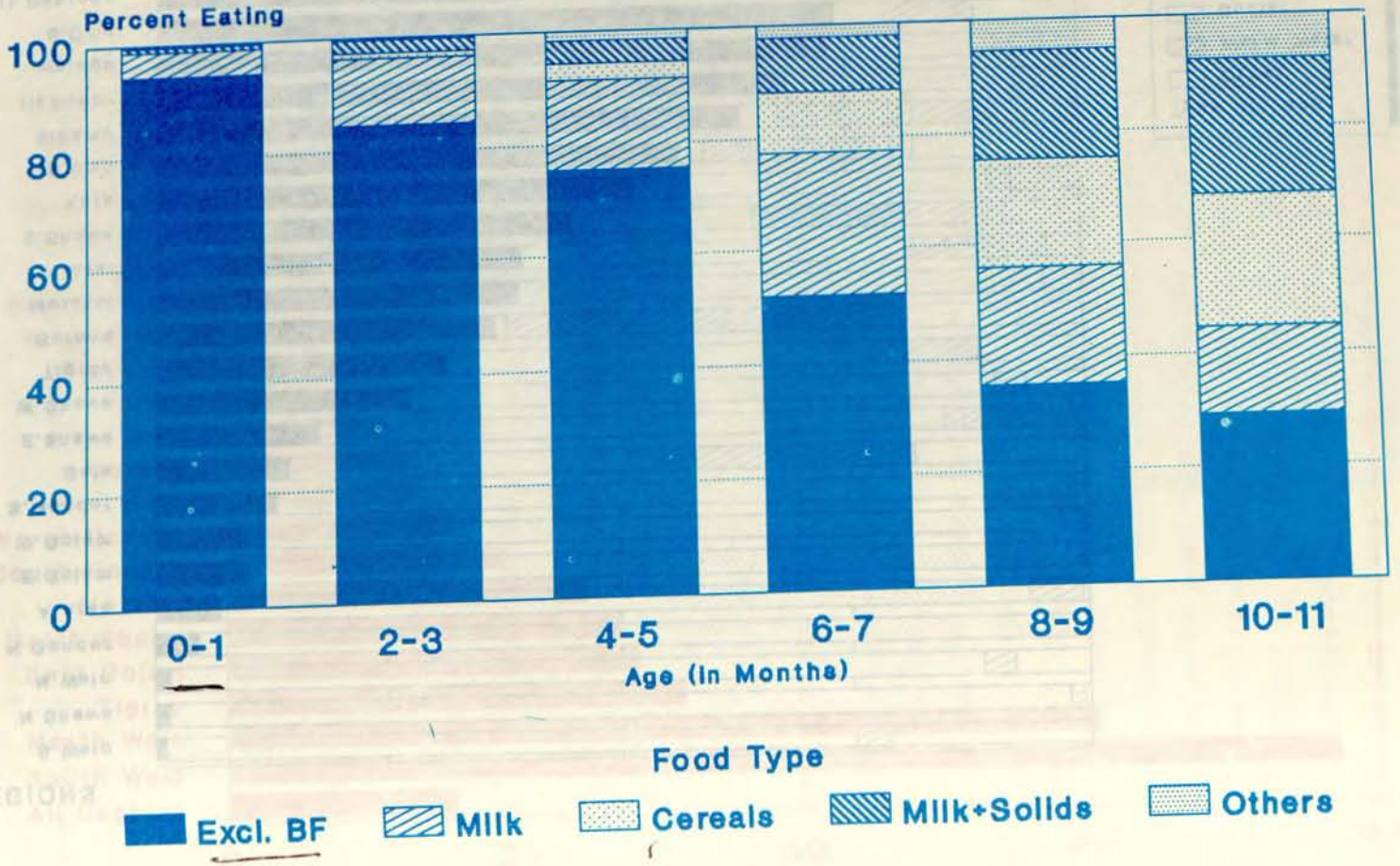
Source: 1992 Rural National Nutrition Survey. (CSA)

Fig. 37-FIRST FOODS/LIQUIDS GIVEN AFTER BIRTH



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 38-Distribution of Infants by Foods Eaten in Prior Months



Source: 1992 Rural National Nutriton Survey. (CSA)

nutritional status was recognized by their mothers constituted 59%. Similarly, 51% of older (wasted) children were correctly identified. Undoubtedly the ability to recognize poor growth would be even poorer in considering less extreme degrees of growth faltering. This suggests an important role for educating mothers concerning the visual signs of poor growth, even if formal growth monitoring programs are not deemed feasible in some areas. Figure 39 show the regional variation in these reponses, which range from a low of about 25% in North Shewa, to a high of 72% in Tigray (for all children aged 6 - 59 months).

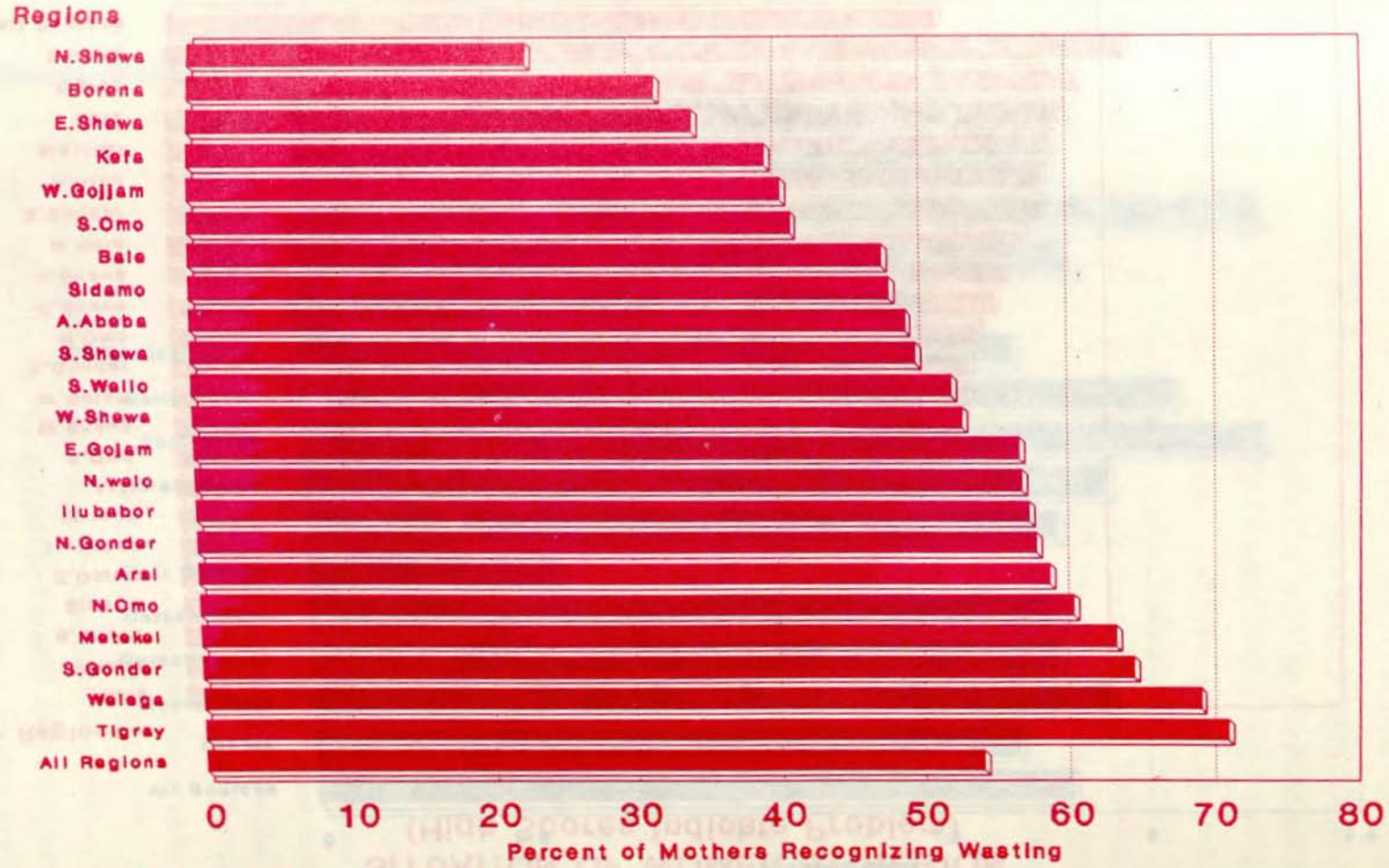
3. The Situation of Mothers

The final set of indicators prepared for this report relates to the situation of mothers in the rural areas. As suggested in the concpetual framework presented earlier, this is a vitally important theme for improving child health, nutrition and survival. It is also a very large topic, which could not be treated in any level of detail in a national survey. Instead, the survey was designed to collect information on some key indicators with a bearing on the situation of women, which could be used to identify regions and population groups which appear particularly disadvantaged.

As shown in Table 42 at the end of the report, five indicators were chosen. These are: the percent of mothers with three children under the age of five years currently under their direct care (national average=7.7%); the percent of mothers under 20 years of age (4.6%); the percent of mothers with no formal education (91.9%); the percent of fathers with no formal education (64.1%); and the percent of mothers who are de facto responsible for managing the household (15.7%). The latter includes "female headed households" in the usual sense, as well as mothers who were reportedly "living apart" from their partners. Father's education was chosen because, it was reasoned, women living with better educated husbands are in a better situation than those with less educated husbands.

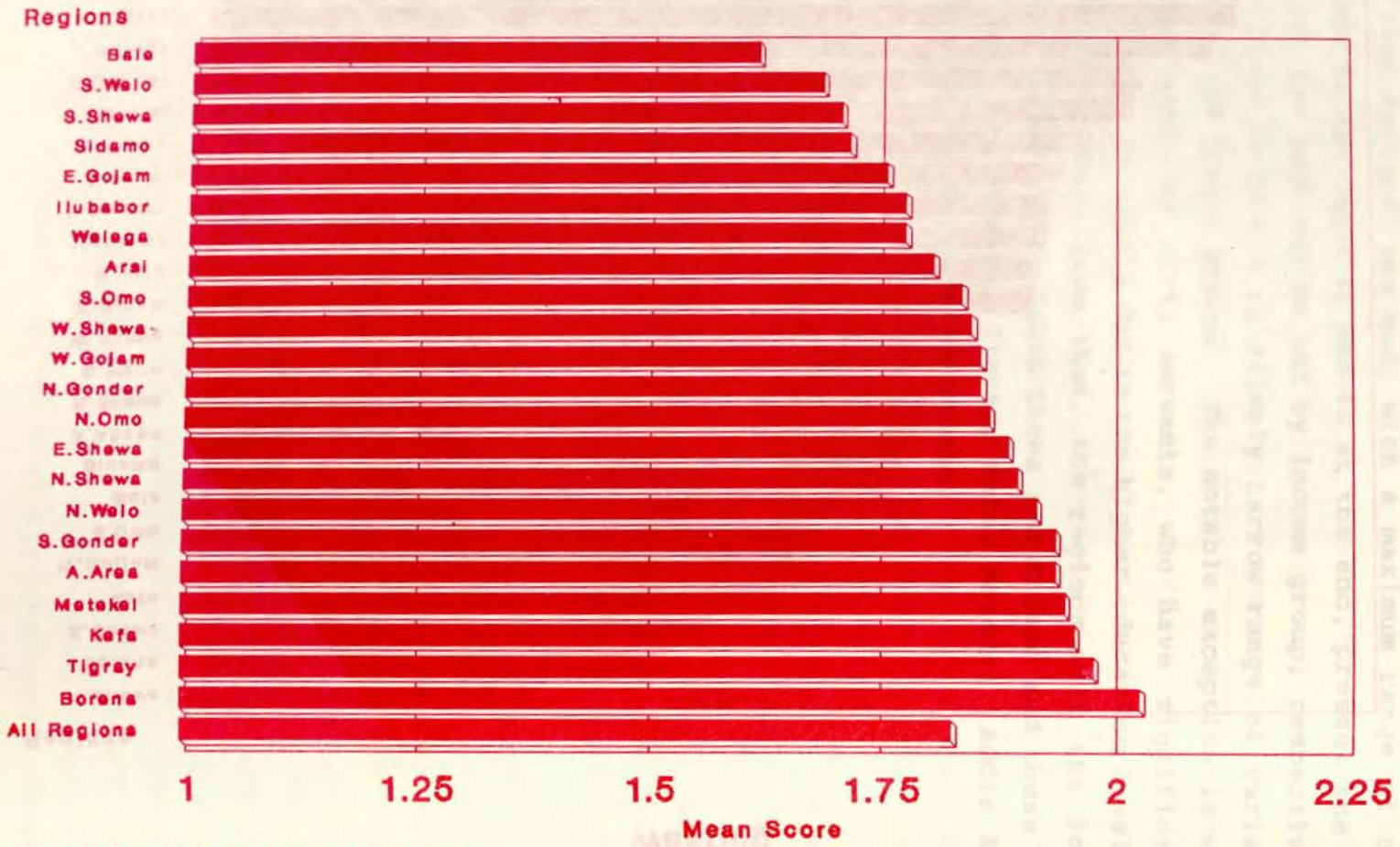
Tables 42 and 43 present the results for each of these indicators by region and source of income, respectively. In addition, a sumnmary score was calculated for each woman (representing the number of "risk factors" she had, with a maximum range of 0-5). Figures 40 and 41,and Table 42 and 43 at the end, present the mean summary scores for each region and by income group, respectively. The mean is found to have a relatively narrow range of variation across regions and income groups. The notable exception is women in households headed by civil servants, who have significantly fewer risk factors (primarily due to the higher education levels in such households). Apart from that, the regions with the lowest means are Bale, South Wello, South Shewa and Sidamo and those with the highest means are Borena, Tigray, Kefa, Metekel, Addis Abeba and South Gonder, in the order mentioned.

Fig.39-Percent of Mothers Recognizing Wasting



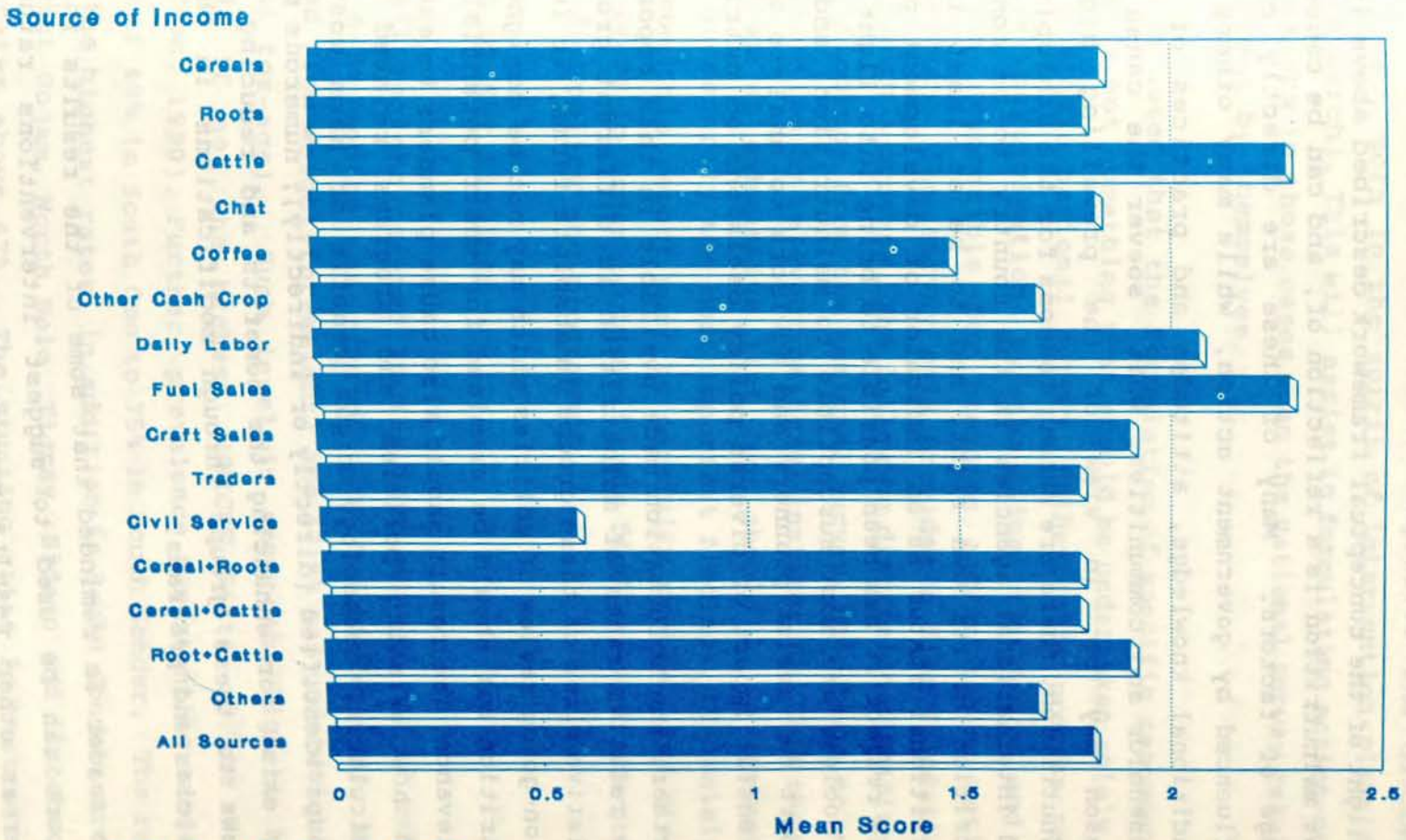
Source: 1992 Rural National Nutrition Survey, (CSA)

Fig. 40-MEAN SCORES SUMMARIZING THE SITUATION OF WOMEN BY REGION (High Scores Indicate Problem)



Source: 1992 Rural National Nutrition Survey, (CSA)

Fig 41-MEAN SCORE SUMMARIZING THE SITUATION OF WOMEN BY SOURCE OF INCOME (High Scores Indicate Problem Groups)



Source: 1992 Rural National Nutition Survey, (CSA)

IV IMPLICATIONS FOR ACTION

A. Long-Term Policy and Planning

In light of the conceptual framework described above it is apparent that malnutrition is a reflection of, and can be caused by, a wide range of factors. Many of these are directly or indirectly influenced by government action, while many others reflect the traditional knowledge, attitudes and practices of individuals, households and communities. What soever the cause and /or the reason may be, in view of the prevailing high level of malnutrition, there are strong reasons for the Ethiopian Government and international agencies in the country to be concerned about nutrition in its own right, and to be at least interested in nutritional status as an indicator of development processes. In this respect it has been possible to bring into light which groups in society are most susceptible to malnutrition, and the present report can assist planners and advisors to analyse or review the potential impact of diverse policy decisions on nutrition.

Further, the information made available in this report concerning the relative rates of malnutrition in different groups, and the relative sizes of these groups in absolute terms, is fundamental to an on-going review of policies which may not be designed to improve nutrition but should be examined for their potential nutritional relevance. The result should also cause planners to examine whether and how existing policies and programs related to improved agricultural technology might benefit or harm most vulnerable groups identified (directly or indirectly); numerous possibilities may exist for enhancing the benefits and reducing the possible risks to these groups through modifications in the design of policies and programs.

The reader is reminded that some of the results in the present report can be used to suggest interventions rather directly, whereas other results may serve to highlight issues requiring

further discussion and investigation. The national survey described here is only one component of the overall NNSS; other components are intended to carry out further investigations only as required, and in the most practical, least expensive and quickest way possible (i.e., more in the spirit of intervention planning than academic research). This will assist in formulating action-oriented recommendations in those cases when the national survey results are not sufficient by themselves.

It should be noted that the formulation of specific recommendation for action is not something that should be undertaken solely on the basis of a single national survey. Rather, this process requires the active participation by the line ministries and other institutions responsible for planning and/or taking action in various sectors. The survey only provides a firm foundation for supporting such a process. The following discussion summarizes some of the key findings from the national survey, which seem to warrant further attention by relevant national institution. This should not be viewed as an exhaustive list, nor should it be assumed that these are necessarily the most important findings. Ultimately, the results from this report must be carefully reviewed and discussed among the users in order to identify the findings with the greatest relevance for policy and programmes.

B. Summary of Key Findings

1. For all regions covered in the 1992 survey, 64% of children aged 6-59 months are stunted (low height-for-age), 8% are wasted (low weight-for-height) and 47.7% are underweight (low weight-for-age). Such level is among the highest in the world, if not the highest (UNICEF State of the World's Children, 1990). Further, prevalence for stunting range from a low of 49% in South Omo to 75% in South Gonder. The regions with the highest rates, in addition to South Gonder, are East and West Gojam, North Welo, Tigray, Sidamo and Ilubabor, all with rates above 67%. The stunting rates in most of these

high-risk regions are high for young children (6-23 months) as well as older children (24-59 months).

2. It has also been possible to arrive at a convincing evidence that the nutritional status of children is significantly worse in 1992 than it was in 1983. General malnutrition (under weight), for instance, increased from about 37 percent in 1983 to a high of 47 percent in 1992. This appears true in all regions examined, with the most notable declines in nutritional status being found in Sidamo, Arsi and Ilubabor.

3. The survey reveals that malnutrition varies considerably according to the primary source of household income, but the strength and direction of this association depends upon the child's age. Within a given type of farming system, malnutrition also varies according to the size of cultivated areas. However, this is only observed among older children and the direction and strength of the association varies across regions.

4. Another striking feature that is worth mentioning is the observed burden of disease at such young ages. Over all ages, 38.3% of children had some type of illness during the two weeks prior to the date of interview. Roughly one-third of these children had illnesses that lasted 1-4 days, another one-third lasted 3-7 days and another one-third lasted 8-14 or more days. As shown in Table 25, the most common symptoms were diarrhea and fever (each affecting about 8.5% of all children and 22% of sick children). Another 4% of children experienced diarrhea together with vomiting, making the total affected by diarrhea equal to 12.5% of all children and 33% of all sick children. Borena stands out as the region with the highest diarrheal burden (24% of children), followed by Tigray, Metekel and North Omo each with about 16%. In almost all regions by far, the dominant water sources are rivers, springs and unprotected wells.

5. Stunting is already highly prevalent even among 6-11 month-old infants (59% for boys and 54% for girls). This suggests that it may be caused by factors affecting mothers during pregnancy and/or factors operating during infancy. Further, in some regions stunting is markedly higher among younger children (North, South and East Shewa, South Welo, Borena, Arsi and Kefa). Similarly, wasting peaks in the period 12-23 months, with prevalence of 13% for boys and 10% for girls. These peaks are largely a reflection of the increased burden of infection and problems during the weaning period. They are found in most populations, but not to the same extent as those shown here for Ethiopia.

6. Stunting among young children varies widely across ethnic groups, ranging from a low of 55% among the Konso, Ari/Ara and Gamo, to a high of 77% among the Kimant and Kembata. Wasting also shows a wide range, from a low of under 5% among the Kefa and Borena, to a high of 18.6% among the Tigraway. The reasons for these variations are not apparent from the present survey, and deserves further study.

7. Bearing in mind that the recommended age for introducing first weaning foods is 4-6 months, it has been observed that the median age is just over 7 months in Ethiopia. This varies across regions from a low of 3.7 months in North Omo, to an astounding high of 12.1 months in North Gonder and Tigray. These results suggest that a very large proportion of infants are being exclusively breastfed far beyond the recommended age, making it virtually impossible to meet their energy and nutrient requirements. Further analysis reveals that the late introduction of weaning foods is strongly associated with the prevalence of stunting among 6-23 months-old. Related to this is the practice of feeding the child warm water or butter as a type of purgative immediately after birth. This is dominant pattern in most regions, and stands a high chance of introducing infections to the newborn child, especially if breastfeeding is also delayed for over 12 hours, there are

findings which lend themselves to immediate action in the affected groups.

8. Only 59% of mothers of young (wasted) children correctly responded that their child was not growing well. 51% of older (wasted) children responded correctly. Undoubtedly the ability to recognize poor growth would be even poorer if less extreme degrees of growth faltering were considered. This suggests an important role for educating mothers concerning the visual signs of poor growth. Growth monitoring may be a feasible and appropriate approach for doing this in some settings, but education can be based on more direct visual signs in those cases where growth monitoring is not feasible or appropriate.

9. Although this report reveals some regional variations in indicators of the situation of women, it should be noted that these indicators do not reveal the full importance of the roles and status of women in the causation of malnutrition. Referring to Figure 3 (conceptual framework) it should be noted that all of the intermediate (or "underlying") causes are affected to a great extent by the roles and status of women in society. Their own health and nutritional status affects reproduction (and subsequent growth and development of children), and their social and educational status affects their ability to fulfill their roles in economic and domestic activities. The central role of women as gatekeepers of household food/economic security, child care and feeding, and health status should be an explicit element of policy review and intervention design, even though the indicators presented in this report were not able to fully capture these dynamics.

C. Next Steps

As stated elsewhere in this report, it is seldom possible to articulate clear and specific recommendations about the kinds of programs and/or policy changes required, solely on the basis of a

report such as this. The purpose of this survey is to describe the levels and trends in malnutrition and closely related factors in different population groups, but it is not designed to answer why these patterns exist and what should be done about it. Answers to these questions must come from more detailed knowledge of the behaviors and conditions affecting different groups and an analysis of the policy or intervention options available for improving these conditions. For these reasons, the major recommendations from this report relate to the initiation of a process to answer these action-oriented questions. Specifically, it is proposed that:

1. A small number of task forces or discussion groups should be established to carefully review the findings contained in the present report. These groups might be organized along institutional lines (MOA,MOH,etc.) with input from other relevant institutions (donors,university, etc), or they might be organized along thematic lines which cross institutional boundaries (e.g., infant/child feeding, factors affecting health status, factors affecting household food security). The purpose of these groups would be to involve a wider group of individuals and institutions in analyzing the policy or programmatic implications of these findings, including in this group the key planners, advisors, programme managers and others responsible for taking action.

2. The above groups should formulate recommendations for the next steps in relation to their own particular focus. The next steps might include one or more of the following:

   o Immediate design or modification of action programmes or policies in various institutions;

   o More detailed analysis or tabulation of results from the national survey, to answer specific questions;

- o Consultation with additional knowledgeable persons at national, regional awraja levels to answer specific questions;

- o Initiation or field visits with local-level discussion groups and interviews,to obtain a qualitative sense of the conditions affecting groups with high rates of malnutrition or related problems, and to identify promising points of intervention;

- o Initiation of longer-term field visits for the same purpose as above, when the nature of the problem is more complicated;

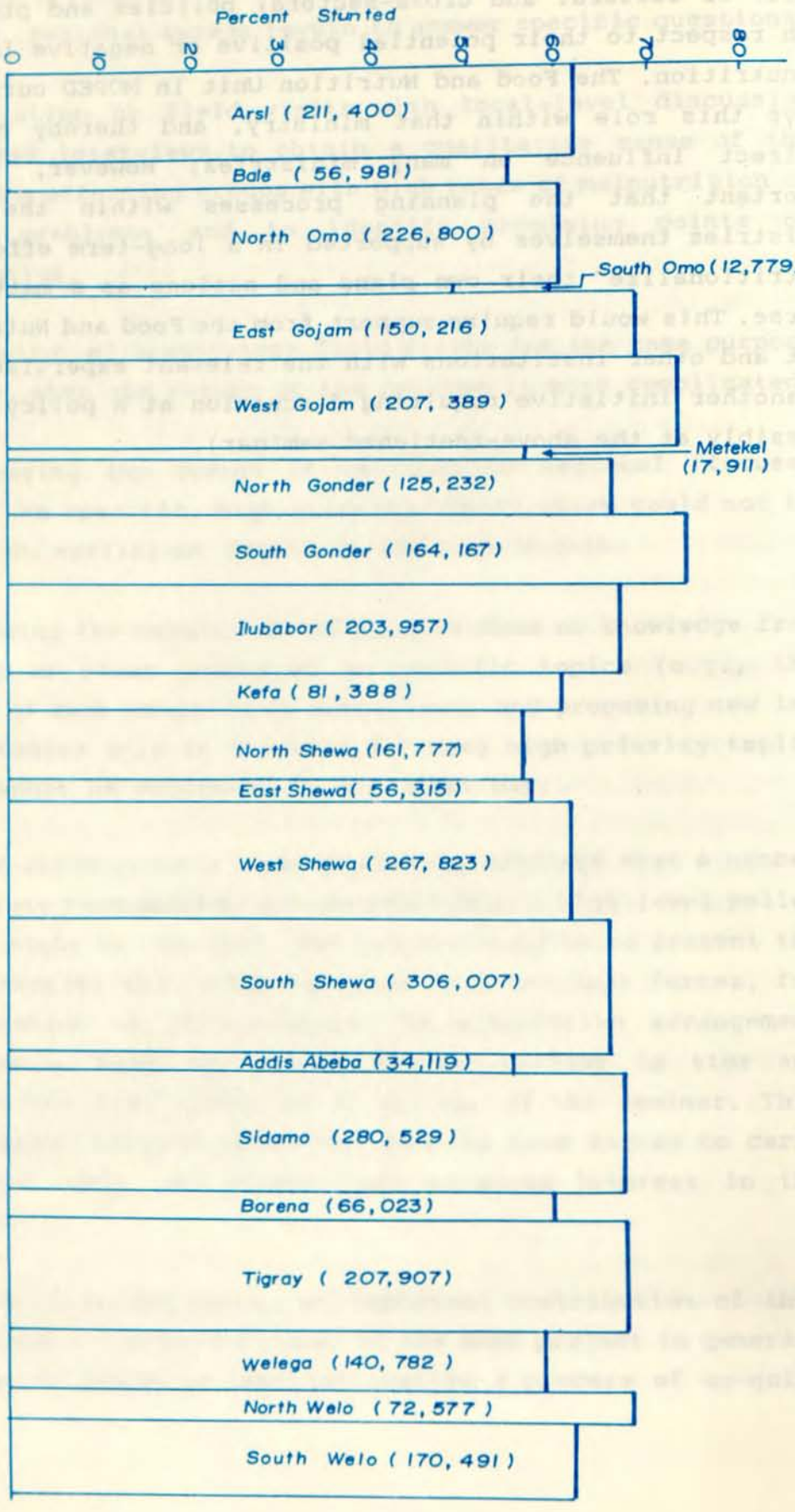
- o Proposing the design of national or regional "focused modules" on specific, high-priority topics which could not be covered in sufficient detail in the core module;

- o Reviewing the results of existing studies or knowledge from Ethiopia or other countries on specific topics (e.g., the effects of cash cropping on nutrition), and proposing new in-depth studies only as required for very high priority topics which cannot be addressed in any other way;

3. Once the above process is sufficiently advanced that a number of concrete recommendations are available, a high-level policy seminar might be convened. The purpose would be to present the survey results and recommendations from the task forces, for consideration by policy-makers. An alternative arrangement would be to hold the policy seminar earlier in time and organize the task forces as an outcome of the seminar. This would bestow greater authority upon the task forces to carry out their work, and create some advanced interest in the results.

4. In addition to the above, an important contribution of this survey, and a longer-term goal of the NNSS project in general, would be to begin to institutionalize a process of on-going

review of sectoral and cross-sectoral policies and programs with respect to their potential positive or negative impacts on nutrition. The Food and Nutrition Unit in MOPED currently plays this role within that ministry, and thereby has an indirect influence on many ministries; However, it is important that the planning processes within the line ministries themselves by supported in a long-term effort to "nutritionalize" their own plans and actions as a matter of course. This would require support from the Food and Nutrition Unit and other institutions with the relevant expertise, and is another initiative requiring discussion at a policy level (possibly at the above-mentioned seminar).



* Number in brackets are raised number of Stunted Children.

Figure 42 Distribution of Stunted Children by Region*

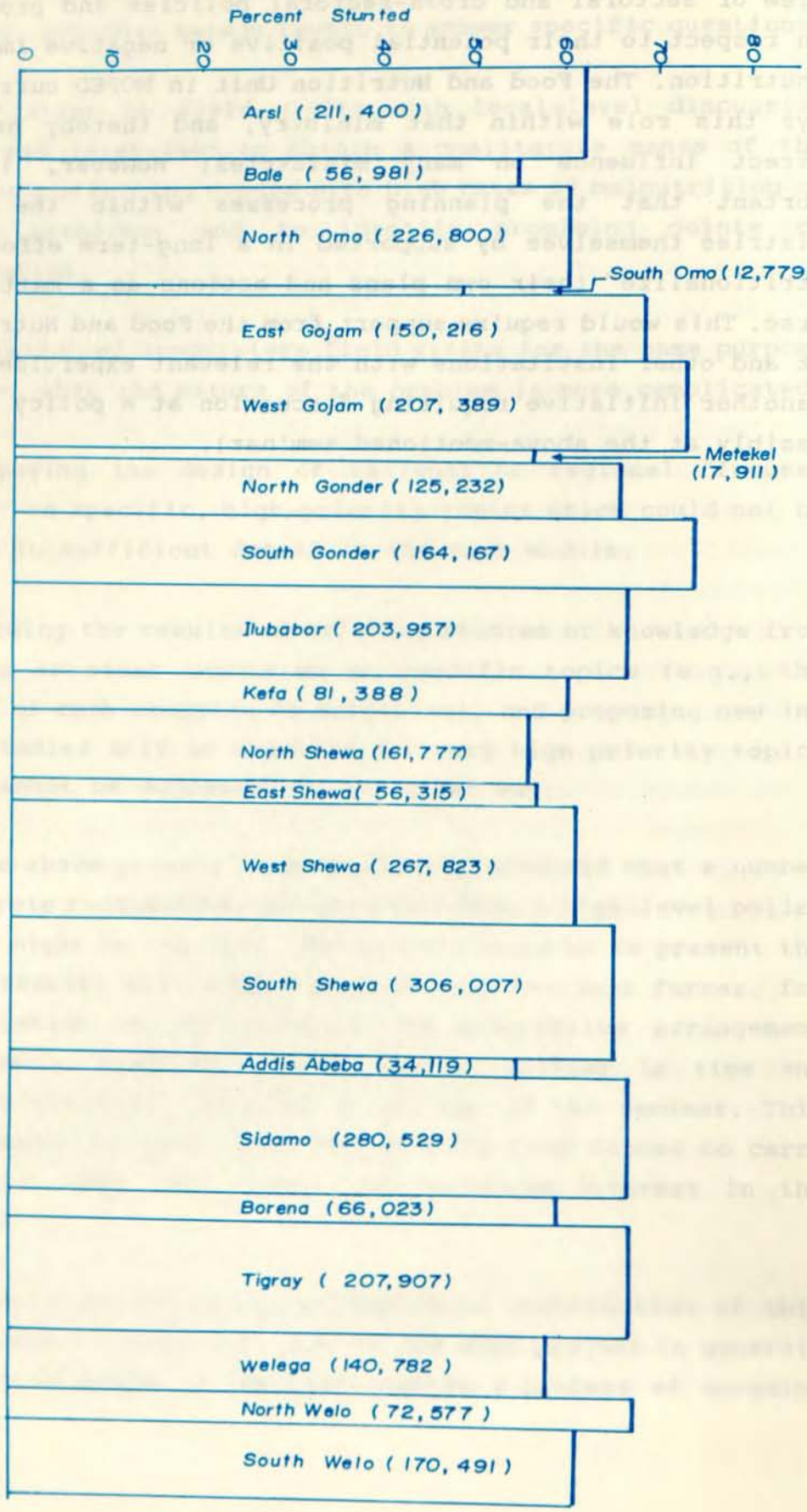


Figure 42 Distribution of Stunted Children by Region*

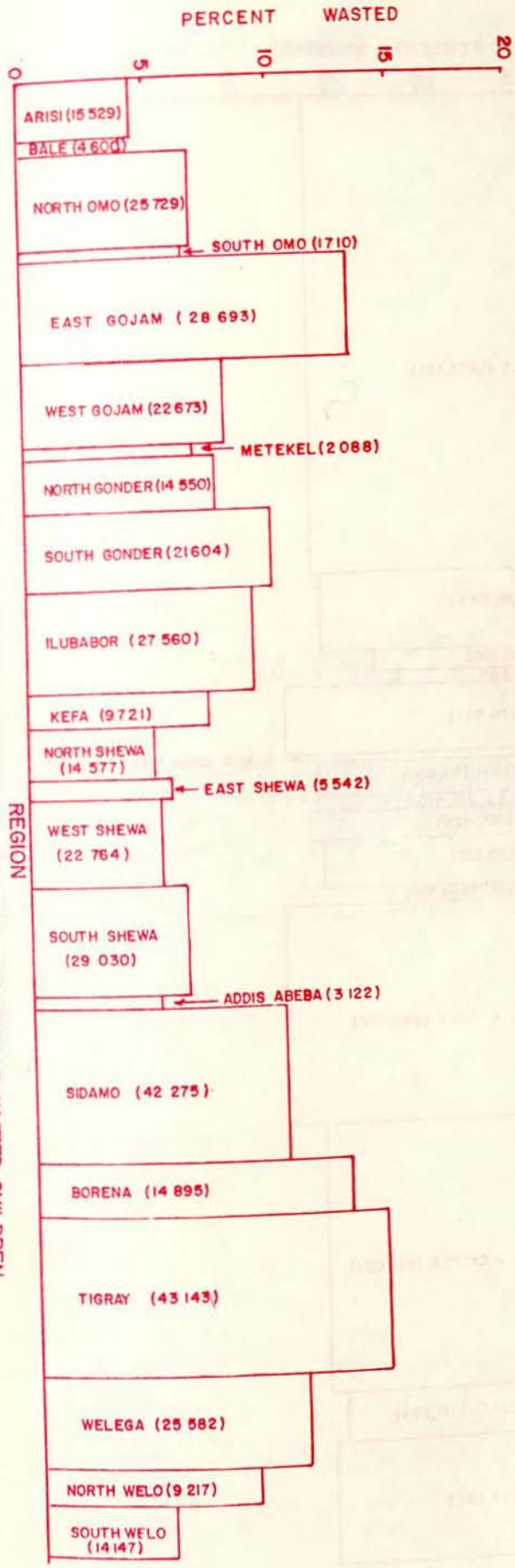
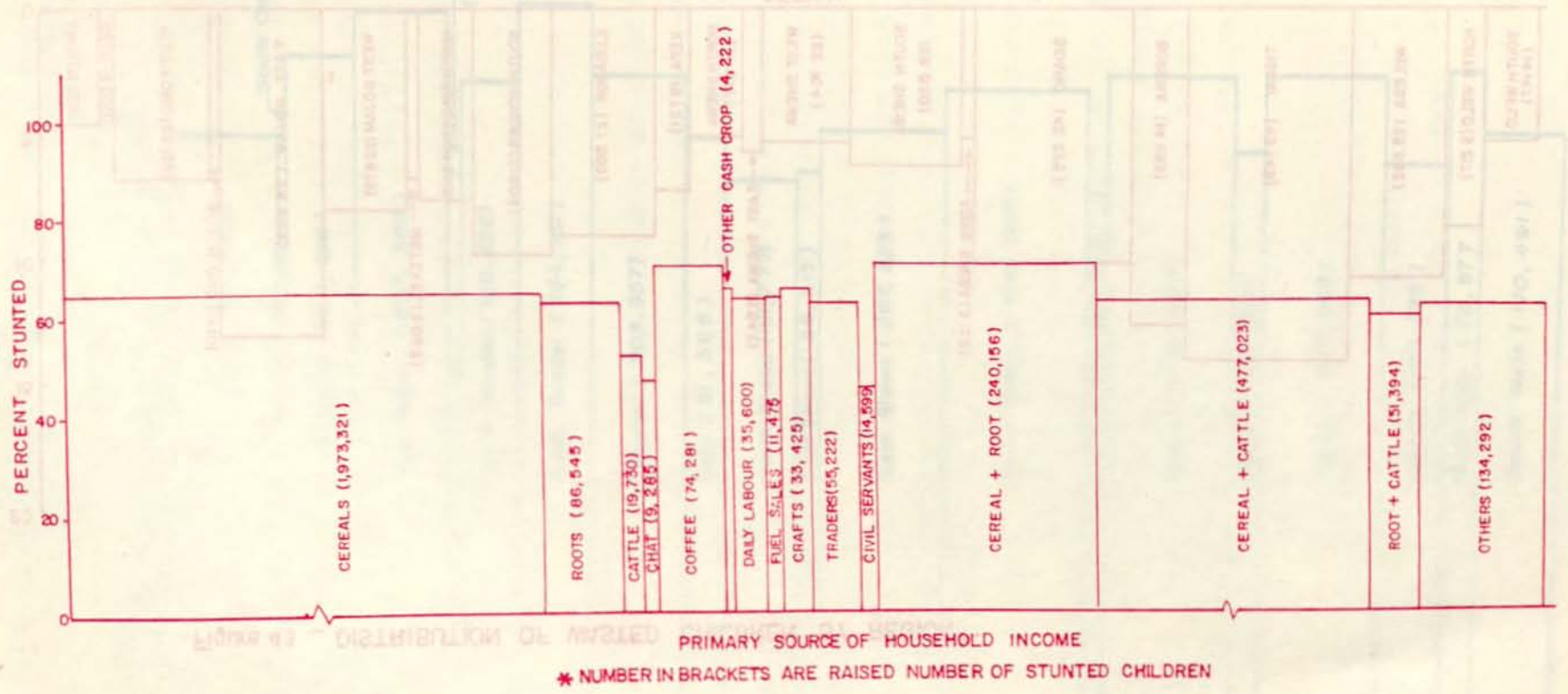


Figure 43 – DISTRIBUTION OF WASTED CHILDREN BY REGION *

Figure 44 - DISTRIBUTION OF STUNTED CHILDREN BY PRIMARY SOURCE OF HOUSEHOLD INCOME *



* NUMBER IN BRACKETS ARE RAISED NUMBER OF STUNTED CHILDREN

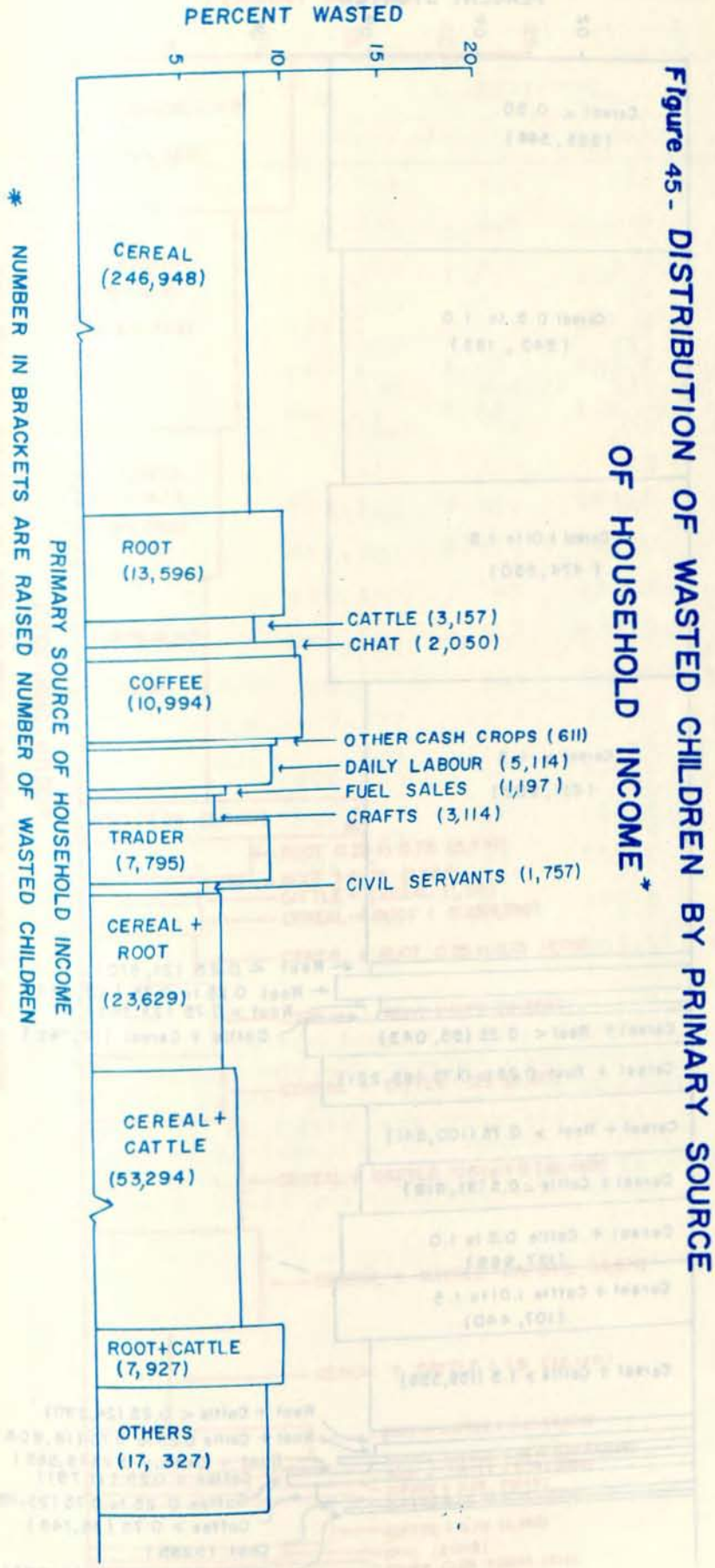


Figure 45- DISTRIBUTION OF WASTED CHILDREN BY PRIMARY SOURCE OF HOUSEHOLD INCOME*

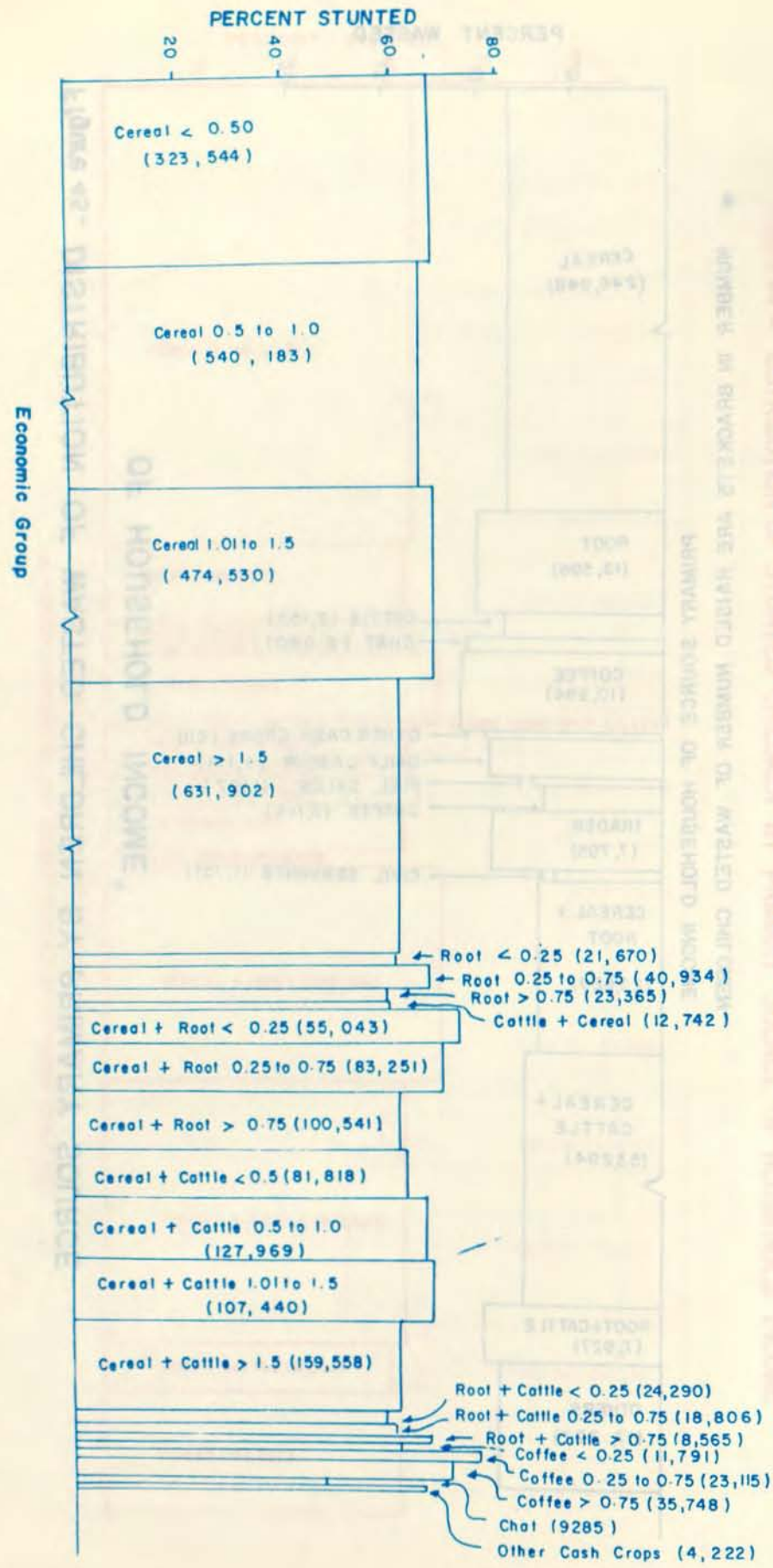


Figure 46 - DISTRIBUTION OF STUNTED CHILDREN BY ECONOMIC GROUP AND SIZE OF CULTIVATED LAND (IN HECTAR)

*** NUMBER IN BRACKETS ARE RAISED NUMBER OF STUNTED CHILDREN**

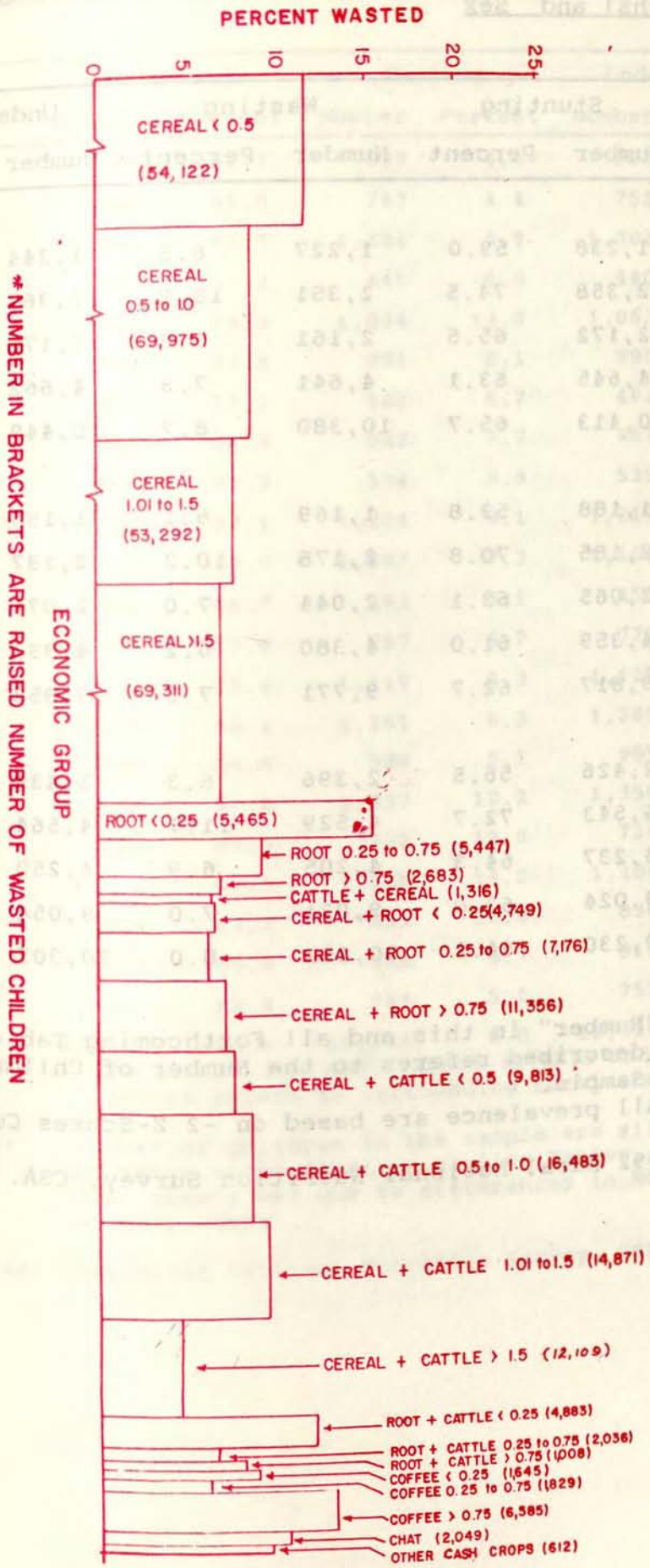


Figure 47. DISTRIBUTION OF WASTED CHILDREN BY ECONOMIC GROUP*

Table 3- Prevalence of Stunting, Wasting and Underweight by Age (in months) and Sex

Age & Sex	Stunting		Wasting		Underweight	
	Number	Percent	Numder	Percent	Number	Percent
Boys						
6-11	1,238	59.0	1,227	6.5	1,244	42.5
12-23	2,358	74.5	2,351	13.0	2.367	59.7
24-35	2,172	65.5	2,161	6.9	2,176	50.4
36-59	4,645	63.1	4,641	7.9	4,662	45.3
All Ages	10,413	65.7	10,380	8.7	10,449	49.3
Girls						
6-11	1,188	53.8	1,169	6.1	1,195	36.2
12-23	2,185	70.8	2,178	10.2	2,197	50.0
24-35	2,065	63.1	2,044	7.0	2,074	50.4
36-59	4,359	61.0	4,380	6.2	4,392	44.5
All Ages	9,817	62.7	9,771	7.2	9,858	45.9
Both Sexes						
6-11	2,426	56.5	2,396	6.3	2,439	39.5
12-23	4,543	72.7	4,529	11.7	4,564	55.0
24-35	4,237	64.3	4,205	6.9	4,250	50.4
36-59	9,024	62.0	9,021	7.0	9,054	44.9
All Ages	20,230	64.2	20,151	8.0	20,307	47.7

Note: 1- "Number" in this and all Forthcoming Tables, unless described referes to the Number of Children in the Sample.
2- All prevalence are based on -2 Z-Scores Cut-Off.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 4- Prevalence of Stunting, Wasting and Underweight by Region

Region	Stunting		Wasting		Underweight	
	Number	Percent	Number	Percent	Number	Percent
Arsi	941	62.7	933	4.6	939	41.1
Bale	745	55.0	743	4.4	751	29.2
N.Omo	1,385	60.7	1,384	6.9	1,382	48.5
S.Omo	444	49.2	445	6.6	440	35.9
E.Gojam	1,052	68.9	1,044	13.3	1,063	54.1
W.Gojam	992	73.6	991	8.1	995	53.8
Metekel	483	57.2	482	6.7	482	42.6
N.Gonder	985	66.4	982	7.7	987	52.9
S.Gonder	537	74.5	534	9.9	539	62.0
Ilubabor	1,207	67.1	1,204	9.1	1,217	52.5
Kefa	1,102	60.9	1,097	7.3	1,104	38.2
N.Shewa	450	56.7	452	5.1	450	31.1
E.Shewa	768	57.6	767	5.7	770	40.2
W.Shewa	1,122	62.1	1,119	5.3	1,125	39.8
S.Shewa	1,275	66.1	1,261	6.3	1,285	44.4
A.Ababa[1]	989	55.5	988	5.1	989	33.3
Sidamo	1,346	67.2	1,337	10.2	1,356	55.0
Borena	731	55.9	722	12.8	734	45.4
Tigray	1,272	67.9	1,268	14.2	1,284	59.9
Welega	854	59.2	853	10.8	856	51.6
N.Welo	867	68.6	805	8.7	811	53.0
S.Welo	746	62.3	743	5.2	751	47.3
Total	20,233	64.2	20,154	8.0	20,310	47.6

[1] The result for Addis Ababa in this and all forthcoming tables refers to surrounding rural areas of the city.

Note: Number of children in the sample are slightly different to those noted in other similar Tables. This insignificant discrepancy was due to differences in Not Stated and/or missing cases.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 5-Prevalence of Stunting by Region and Child's Age

Region	6-23 Mos		24-59 Mos	
	Number	Percent	Number	Percent
Arsi	346	68.9	594	59.2
Bale	255	57.8	490	53.5
N.Omo	495	58.7	889	61.9
S.Omo	151	50.9	293	48.4
E.Gojam	376	70.5	676	68.1
W.Gojam	350	77.2	642	71.5
Metekel	139	60.1	344	55.8
N.Gonder	352	63.6	633	68.0
S.Gonder	201	75.6	336	73.9
Ilubabor	440	64.0	767	68.8
Kefa	389	65.4	712	58.2
N.Shewa	180	70.2	270	47.9
E.Shewa	281	65.7	487	53.0
W.Shewa	413	60.8	709	62.8
S.Shewa	398	67.8	877	65.4
Addis Ababa	331	59.5	658	53.5
Sidamo	423	64.7	920	68.3
Borena	209	70.0	532	50.2
Tigray	403	71.7	868	66.2
Welega	297	62.1	557	57.7
N.Welo	282	81.4	525	61.7
S.Welo	257	70.1	489	57.9
All Regions	6,968	67.0	13,258	62.8

Note: Same as Table 4.

Source: 1992 Rural National Nurtition Survey, CSA.

Table 6-Prevalence of Wasting by Region and Child's Age

Region	6-23 Mos		24-59 Mos	
	Number	Percent	Number	Percent
Arsi	343	7.4	589	3.1
Bale	253	7.5	490	2.9
N.Omo	496	8.5	887	5.9
S.Omo	152	12.8	293	3.4
E.Gojam	372	18.7	672	10.2
W.Gojam	348	8.7	643	7.7
Metekel	138	4.6	344	7.6
N.Gonder	350	13.1	632	4.8
S.Gonder	201	15.3	333	6.6
Ilubabor	435	12.8	769	6.9
Kefa	384	6.4	712	7.8
N.Shewa	181	3.3	270	6.3
E.Shewa	281	7.8	486	4.4
W.Shewa	412	7.7	707	3.9
S.Shewa	393	5.7	868	6.6
Addis Ababa	331	9.3	658	2.9
Sidamo	420	8.7	915	10.8
Borena	204	10.1	518	13.8
Tigray	397	19.5	870	11.8
Welega	298	14.3	555	8.9
N.Welo	280	10.4	525	7.8
S.Welo	256	6.7	487	4.3
All Regions	6,924	9.8	13,223	7.0

Note: Same as Table 4.

Source: 1992 Rural National Nurtition Survey, CSA.

Table 7-Change in Stunting Between 1983-92, by Region

Region	1983				1992			
	Number	Percent stunted	Mean*	S.D*	Number	Percent Stunted	Mean*	S.D*
Arsi	855	56.7	-2.17	1.84	941	62.7	-2.29	1.41
Bale	683	50.7	-2.02	2.00	745	55.0	-2.15	1.59
Gamo-Gofa	603	66.3	-2.68	2.12	1,465	55.0	-2.25	1.66
Gojam	748	64.7	-2.60	1.70	2,527	70.7	-2.76	1.55
Gonder	744	74.1	-2.95	1.81	1,522	70.8	-2.27	1.45
Iluba-bor	591	51.3	-1.94	2.27	692	61.6	-2.54	1.65
Kefa	681	60.8	-2.49	2.04	1,672	66.6	-2.65	1.67
Shewa	1,701	59.8	-2.48	2.07	4,604	61.7	-2.44	1.62
Sidamo	597	62.1	-2.53	1.97	2,386	64.9	-2.62	1.78
Welega	1,068	52.6	-2.08	1.77	854	59.2	-2.30	1.41
Welo	547	67.5	-2.90	2.12	1,553	64.0	-2.55	1.60
All-Region	9,437	59.8	-2,38	2.03	18,873	64.0	-2.52	1.45

* Mean and S.D values in this and forthcoming tables refers to Z-score.

Note: Same as Table 4.
Source: 1992 and 1983 Rural National Nurtition Survey, CSA.

Table 8-Change in wasting Between 1983-92.by Region

Region	1983				1992			
	Number	Percent	Mean	S.D	Number	Percent	Mean	S.D
Arsi	855	3.5	+.17	1.29	933	4.6	-.40	1.00
Bale	683	4.5	+.16	1.54	743	4.4	-.14	1.19
Gamo-Gofa	603	5.8	+.29	1.65	1,465	6.5	-.49	1.06
Gojam	748	8.4	-.28	1.46	2,517	10.1	-.48	1.31
Gonder	744	7.3	-.29	1.41	1,516	8.9	-.65	1.07
Iluba-bor	591	11.3	-.38	1.66	692	10.2	-.56	1.28
Kefa	681	8.1	-.10	1.56	1,664	7.2	-.39	1.28
Shewa	1,701	7.6	-.13	1.70	4,587	5.6	-.28	1.21
Sidamo	597	5.9	+.09	1.51	2,368	9.9	-.56	1.21
Welega	1,068	10.7	-.65	1.22	853	10.8	-.79	1.03
Welo	547	10.1	-.65	1.22	1,548	6.2	-.48	1.09
All-Region	9,437	8.1	-.09	1.60	18,886	7.6	-.45	1.19

Note: Same as Table 4.

Source: 1992 and 1983 Rural National Nurtition Survey, CSA.

Table 9-Change in Under Weight Between 1983-92, by Region

Region	1983				1992			
	Number	Percent	Mean	S.D	Number	Percent	Mean	S.D
Arsi	855	25.5	-1.26	1.23	939	41.1	-1.75	1.00
Bale	683	23.0	-1.18	1.29	251	29.2	-1.47	1.01
Gamo-Gofa	603	35.6	-1.57	1.29	1,459	43.5	-1.79	1.15
Gojam	748	47.2	-1.88	1.19	2,540	53.2	-2.08	1.03
Gonder	744	50.5	-2.10	1.10	1,526	57.8	-2.22	.99
Iluba-bor	591	36.5	-1.54	1.40	694	49.6	-2.01	1.06
Kefa	618	40.0	-1.70	1.35	1,682	48.0	-1.95	1.11
Shewa	1,701	33.8	-1.47	1.32	4,619	39.3	-1.75	1.05
Sidamo	597	35.8	-1.47	1.35	2,398	52.8	-2.03	1 15
Welega	1,068	43.5	-1.81	1.21	856	51.6	-2.01	1.04
Welo	547	45.3	-1.88	1.32	1,562	48.9	-1.97	1.05
All-Regions	9,437	37.3	-1.60	1.31	19,026	46.9	-1.92	1.08

Note: Same as Table 4.

Source: 1992 and 1983 Rural National Nurtition Survey, CSA.

Table 10-Changes in Stunting and Wasting by region,1983-92: Differnces in Prevalence and Means.

Region	Stunting		Wasting	
	Change in percentage point	Change in Mean	Change in percentage points	Change in Mean
Arsi	+6.0	-.12	+1.1	-.57*
Bale	+4.3	-.13	-.0.1	-.30*
Gamo Gofa	-11.3	+.43	+1.7	-.78*
Gojam	+6.0	-.16	+0.7	-.20
Gonder	-3.3	+.68	+1.6	-.36
Ilubabor	+10.3	-.60	-1.1	-.18
Kefa	+5.8	-.16	-0.9	-.29
Shewa	+1.9	+.04	-2.0	-.15
Sidamo	+2.8	-.09	+4.0	-.65*
Welega	+6.6	-.22	+0.1	-.14
Welo	-3.5	+.35	-.39	+.17
All Regions	+4.2	-.14	-0.5	-.36

* These values reflect skewness in the 1983 distributions, probably reflecting measurement error.

Source: 1992 and 1983 Rural National Nurtition Survey, CSA.

Table 11-Prevalence of Stunting and Wasting by Altitude and Age

Age Group (in Months)	Nutritional Status	Altitude (in meters) 800-1599	1600-2399	2400-3199
6 -.23	% Stunted	62.9	69.4	64.0
	% Wasted	10.7	9.6	10.0
24- 59	% Stunted	62.2	66.3	57.4
	% Wasted	7.6	7.6	7.1
Total	% Stunted	62.4	67.4	59.7
	% Wasted	8.8	8.3	7.5
Number of Children in the Sample		3,023	10,584	4,348

Source: 1992 Rural National Nurtition Survey, CSA.

Table 12- Prevalence of Stunting ans Wasting by FA Level Agriculture Type.

Community Agriculture	Stunted		Wasted	
	Number	Percent	Number	Percent
Cereals	2,414,404	64.7	293,667	7.9
Roots	160,758	66.6	27,390	11.4
Coffee	61,515	76.6	6,362	7.9
Cereal+ Root	250,888	60.1	33,077	7.9
Cereal+ Cash Crop	66,001	58.7	10,389	9.4
Cattle	20,637	48.3	4,917	11.6
Others	247,556	63.4	22,949	5.9
Total	3,221,759	64.2	298,751	8.0

Note: Number refer to the raised total (i.e., estimated national tatol)

Source: 1992 Rural National Nurtition Survey, CSA.

Table 13-Prevalence of Stunting by Region and Altitude

Region	800-1599mt.		1600-2399mt.		2400-3199mt.	
	Number	Percent	Number	Percent	Number	Percent
Arsi	136	71.3	358	67.7	412	54.9
Bale	42	31.0	332	55.7	339	56.6
N.Omo	457	59.4	590	61.8	338	59.8
S.Omo	173	60.8	271	44.4	-	-
E.Gojam	-	-	307	76.5	656	66.2
W.Gojam	65	62.6	687	73.7	240	76.3
Metekel	358	58.2	125	55.7	-	-
N.Gonder	-	-	662	68.6	32	81.2
S.Gonder	98	76.9	346	72.7	93	75.9
Ilubabor	207	60.3	968	658.7	-	-
Kefa	425	58.0	312	66.0	35	48.6
N.Shewa	-	-	30	86.7	389	53.8
E.Shewa	176	54.4	522	59.3	37	32.4
W.Shewa	137	51.2	524	68.8	393	57.4
S.Shewa	73	56.9	993	67.5	71	65.6
A.Ababa	-	-	371	54.9	546	54.8
Sidamo	13	78.2	883	71.1	289	54.7
Borena	78	40.0	520	63.0	-.	-
Tigray	123	66.2	880	65.9	65	66.3
Welega	109	65.9	534	60.1	179	51.2
N.Welo	160	43.5	281	69.7	159	65.9
S.Welo	63	64.0	88	72.1	75	82.0
All Regions	3,023	62.4	10,584	67.4	4,348	59.7

Source: 1992 Rural National Nutrition Survey, CSA.

Table 14-Prevalence of Wasting by Region Altitude

Region	800-1599mt.		1600-2399mt.		2400-3199mt.	
	Number	Percent	Number	Percent	Number	Percent
Arsi	139	1.1	355	4.9	407	5.8
Bale	42	2.4	332	3.4	338	5.5
N.Omo	456	10.4	592	5.3	336	4.8
S.Omo	173	7.2	272	6.3	-	-
E.Gojam	-	-	302	10.5	653	14.7
W.Gojam	65	7.5	686	6.9	240	11.9
Metekel	357	4.8	125	9.2	-	-
N.Gonder	-	-	660	8.1	-	-
S.Gonder	97	5.2	343	11.8	94	12.2
Ilubabor	206	15.3	966	8.0	-	-
Kefa	421	9.5	310	5.2	35	14.3
N.Shewa	-	-	30	20.0	391	4.2
E.Shewa	176	5.9	522	5.3	36	11.1
W.Shewa	138	9.7	520	6.9	393	2.4
S.Shewa	72	9.1	983	6.4	71	5.8
A.Ababa	-	-	370	5.4	545	4.1
Sidamo	142	10.1	877	9.3	287	12.1
Borena	78	21.6	513	12.6	-	-
Tigray	123	16.4	880	14.6	61	15.1
Welega	109	6.1	533	11.6	179	7.3
N.Welo	159	4.2	281	3.9	158	13.1
S.Welo	63	6.5	88	3.6	75	5.6
All Regions	3,013	8.8	10,540	8.3	4,299	7.5

Source: 1992 Rural National Nutrtion Survey, CSA.

Table 15- Prevalence of Stunting and Wasting by Agro-ecological System and Child's Age Group (in months).

Main Agricultural Product	Stunting				Wasting			
	6-23		24-59		6-23		24-59	
	Number	%	Number	%	Number	%	Number	%
Cereals	5297	68.9	9868	62.4	5272	10.1	9842	6.7
Roots	238	62.7	540	68.4	235	11.1	536	11.5
Cereals+ Root	571	59.0	1130	60.6	565	8.3	1129	7.8
Coffee	137	73.9	264	78.0	137	7.5	262	8.1
Cereal+ cash crop	133	49.8	259	62.8	127	12.5	258	7.9
Cattle	62	64.9	183	42.0	60	10.6	182	12.0
Others	530	61.9	1014	64.2	528	6.8	1014	5.4
All System	6968	67.0	13258	62.8	6925	9.8	13223	7.0

Source: 1992 Rural National Nutrition Survey, CSA.

Table 16-Pervalence of Stunting and Wasting by Primary Source of Household Income and Child's Age Group (in months)

Primary Source Income	Stunting				Wasting			
	6 - 23		24-59		6 - 23		24-59	
	Number	%	Number	%	Number	%	Number	%
cereal	4,326	68.8	7,949	62.3	4,326	10.2	7,949	7.0
roots	180	65.7	349	61.3	180	9.0	349	10.3
cattle	70	70.6	165	44.0	70	15.0	165	5.5
chat	23	44.8	39	48.5	23	20.9	39	4.6
coffee	169	67.9	347	72.6	169	8.0	347	11.8
other cash crop	12	52.6	27	73.6	12	13.0	27	7.5
daily labor	85	49.1	163	70.8	85	13.7	163	6.8
fuel sales	33	52.7	70	69.2	33	3.0	70	8.5
crafts	96	64.4	128	67.8	96	7.0	128	5.4
trade	127	69.6	245	60.2	127	10.8	245	8.1
civil service	67	52.0	102	41.8	67	9.0	102	3.2
cereal + roots	463	61.4	965	68.5	463	7.2	965	7.2
cereal +cattle	934	68.4	1,902	61.6	934	9.4	1,902	6.0
root + cattle	76	53.6	171	63.6	76	9.7	171	9.1
other	300	60.3	588	64.3	300	8.5	588	8.0
All Groups	6,961	67.0	13,240	62.8	6,961	9.8	13,240	7.0

Note: Same as Table 4.

Source: 1992 Rural National Nurtition Survey, CSA.

Table 17-Prevalence of Stunting by Economic Group*

Primary source of household income	Cultivated area class in Hectar**					Total
	(1)	(2)	(3)	(4)	Not Cultivating	
cereals	67.5	65.0	67.5	61.0	-	64.6
roots	60.4	66.8	58.2	-	-	62.8
cattle	-	-	59.2	-	42.5	52.0
chat	-	-	47.2	-	-	47.2
coffee	60.6	76.7	71.2	-	-	71.1
other cash crop	-	-	65.8	-	-	65.8
daily labor	-	-	-	-	63.7	63.5
fuel sales	-	-	-	-	63.6	63.6
crafts	-	-	-	-	66.3	66.3
trade	-	-	-	-	63.4	63.4
civil service	-	-	-	-	45.9	45.9
other non-cultivation	-	-	-	-	61.7	61.7
cereal + roots	72.3	69.6	61.0	-	-	66.2
cereal + cattle	62.4	65.7	67.0	61.1	-	63.8
root + cattle	58.6	60.5	66.9	-	-	60.4
other crop combination	66.5	63.3	60.7	-	-	62.9

* Economic Group refers to income classes defined by size of cultivated areas of the various agricultural systems

** For systems with roots, chat, coffee, cash crops, area class (1) stands for ≤ .25, (2) for .26-.75, and (3) for >.75 hectars; for cereals systems area class (1) stands for ≤.50, (2) for .5-1.0, (3) for 1.01-1.5, and (4) for >1.5 hectars.

Source: 1992 Rural National Nurtition Survey, CSA.

Table 18-Prevalence of Wasting by Economic Group*

Primary source of household income	Cultivated area class** (1)	(2)	(3)	(4)	Not Cultivating	Total
cereals	11.4	8.5	7.6	6.7	-	8.1
roots	15.2	9.0	6.7	-	-	9.9
cattle	-	-	6.1	-	11.3	8.4
chat	-	-	10.4	-	-	10.4
coffee	8.6	6.1	13.2	-	-	10.6
other cash crop	-	-	9.5	-	-	9.5
daily labor	-	-	-	-	9.1	9.1
fuel sales	-	-	-	-	6.6	6.6
crafts	-	-	-	-	6.1	6.1
trade	-	-	-	-	9.0	9.0
civil service	-	-	-	-	5.5	5.5
other non-cultivatus	-	-	-	-	14.0	6.5
cereal + roots	6.3	6.0	6.9	-	-	7.1
cereal + cattle	7.5	8.4	9.3	4.7	-	9.3
root + cattle	11.8	6.5	8.0	-	-	8.2
other crop combos	6.2	6.9	9.1	-	-	8.0

* Same as Table 17
** Same as Table 17

Source: 1992 Rural National Nutrition Survey, CSA.

Table 19-Prevalence of Stunting and Wasting in Selected Household Agricultural System by Age Group (in months)

Agricultural System	Nutritional Indicator	Cultivated area class* (1)	(2)	(3)	(4)	Prob.
6 - 23 months						
Cereals	stunting	67.8	69.3	71.3	66.9	.052
	wasting	13.7	10.9	8.5	9.2	.117
Roots	stunting	66.5	68.5	60.3	-	.375
	wasting	16.6	6.8	4.9	-	.149
Cereals + roots	stunting	50.9	65.0	63.6	-	.312
	wasting	10.4	3.9	8.3	-	.716
Cereal + cattle	stnting	63.3	69.2	70.1	69.2	.870
	wasing	6.8	13.1	9.7	7.5	.788
Roots + cattle	stunting	49.6	63.2	44.2	-	.634
	wasting	10.8	7.6	10.7	-	.877
Coffee	stunting	57.3	67.3	74.1	-	.026
	wasting	11.9	2.3	7.7	-	.925
24 - 59 months						
Cereals	stunting	67.4	62.5	65.4	57.9	.0000
	wasting	10.1	7.1	7.1	5.2	.0002
Roots	stunting	56.9	65.9	57.1	-	.929
	wasting	14.4	10.0	7.2	-	.093
Cereals + roots	stunting	81.7	71.8	59.8	-	.0000
	wasting	4.5	7.0	6.2	-	.711
Cereals + cattle	stunting	62.0	63.9	65.5	57.3	.085
	wasting	7.8	6.0	9.1	3.3	.004
Roots + cattle	stunting	62.9	59.4	76.0	-	.596
	wasting	12.2	6.0	6.9	-	.260
Coffee	stunting	64.0	81.3	70.0	-	.204
	wasting	7.1	7.9	15.7	-	.005

* Same as Table 17.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 20-Prevalence of Stunting and Wasting among Cereal Growers by Cultivated Area and Region (Children Aged 24-59 months)

Region	Nutri-tional indicator	Cultivated area (ha) Below .50	.50 to 1.0	1.01 to 1.50	Above 1.50	Prob.
Arsi	Stunting	75.8	59.6	65.8	55.9	.081
	Wasting	3.0	4.6	4.2	2.8	.576
Bale	Stunting	-	64.3	64.9	52.8	.066
	Wasting	0.0	2.4	0.0	4.2	.206
N. Omo	Stunting	74.7	63.5	52.6	52.1	.001
	Wasting	10.7	10.3	6.4	5.9	.139
S. Omo	Stunting	66.7	66.0	53.8	50.0	.124
	Wasting	4.8	6.0	7.7	3.6	.874
E. Gojam	Stunting	64.3	55.2	74.7	68.0	.277
	Wasting	7.1	13.8	8.2	11.6	.822
W. Gojam	Stunting	79.5	72.1	75.9	65.9	.105
	Wasting	6.8	8.1	3.8	8.9	.768
Metekel	Stunting	61.8	56.0	64.7	55.3	.337
	Wasting	4.7	8.0	11.8	7.8	.263
N. Gonder	Stunting	81.5	75.0	71.8	68.8	.095
	Wasting	14.8	3.6	5.5	3.6	.072
S. Gonder	Stunting	77.8	78.7	76.2	69.3	.137
	Wasting	11.1	5.0	14.0	4.3	.036
Ilubabor	Stunting	73.7	63.5	70.5	67.8	.807
	Wasting	9.4	8.9	7.1	2.3	.053
Kefa	Stunting	47.5	52.8	61.7	67.3	.021
	Wasting	4.9	11.3	6.4	1.8	.348
N. Shewa	Stunting	-	-	58.7	41.5	.28
	Wasting	0.0	0.0	6.3	5.9	.278
E. Shewa	Stunting	-	64.8	49.5	51.5	.116
	Wasting	9.1	8.0	8.7	3.0	.035
W. Shewa	Stunting	73.3	57.1	68.8	50.0	.016
	Wasting	0.0	3.6	6.6	4.3	.416
S. Shewa	Stunting	65.2	63.9	62.3	65.6	.980
	Wasting	8.8	1.7	6.7	3.2	.416
A. Ababa	Stunting	-	58.9	54.5	49.3	.661
	Wasting	5.9	1.8	8.0	2.2	.05
Sidamo	Stunting	47.9	64.3	57.1	41.2	.982
	Wasting	14.3	9.5	16.7	12.5	.869
Borena	Stunting	33.3	49.0	73.5	52.0	.025
	Wasting	9.5	8.2	20.6	20.0	.083
Tigiray	Stunting	75.3	64.4	64.2	61.3	.005
	Wasting	9.7	11.2	8.6	13.3	.672
Welega	Stunting	57.9	64.1	61.9	56.4	.487
	Wasting	17.5	5.9	3.4	7.7	.095
N. Welo	Stunting	60.5	57.4	60.4	52.6	.631
	Wasting	12.6	4.5	8.2	0.0	.035
S. Welo	Stunting	61.2	55.2	46.8	60.0	.317
	Wasting	6.1	4.6	3.8	5.0	.668
All Regions	Stunting	67.4	62.5	65.4	57.9	
	Wasting	10.1	7.1	7.1	5.4	

Source: 1992 Rural National Nurtition Survey, CSA.

Table 21-Prevalence of Stunting and Wasting by Mother's Ethnic Group and Childs Age

Mother's Ethnicity	Stunting				Wasting*	
	6-23		24-59		6-23	24-59
	Number	%	Number	%	%	%
Amhara	2,117	71.9	3,729	64.2	10.7	6.6
Gurage	250	56.6	473	61.7	9.0	4.8
Tigraway	478	69.8	997	63.9	18.6	11.2
Agew	68	72.7	185	65.8	6.0	8.1
Kimant	61	76.9	134	69.4	11.2	5.3
Oromo	2,129	64.6	3,859	58.9	8.2	5.7
Borena	53	59.9	137	33.8	4.9	7.1
Guji	99	65.4	228	58.7	10.1	13.5
Konso	66	55.5	108	54.1	17.8	15.1
Sidamo	235	64.0	515	72.0	7.0	10.7
Gedeo	156	68.4	345	65.4	13.4	12.3
Hadya	153	70.9	377	72.9	5.9	5.6
Kembata	92	76.6	226	71.9	8.3	6.1
Ari/Ara	139	55.5	288	48.8	10.3	1.2
Gimera/ She/Bench	113	58.4	216	55.9	7.2	5.9
Kefa	105	71.8	194	60.6	4.4	7.2
Gamo	165	56.0	328	60.0	5.8	3.9
Welaita	110	58.3	201	68.0	10.5	7.8
Others	375	66.0	707	61.9	8.6	6.4
All Groups	6,964	67.0	13,247	62.8	9.8	7.0

* Sample sizes similar to those for stunting.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 22-Indicators of Caretaking Practices for Boys and Girls by Mother's Ethnic Groups

Mother's Ethnic Group	6-23 Percent stunted			24-59 Percent stunted		
	Boys	Girls	Ratio[1]	Boys	Girls	Ratio[1]
Amhara	73.9	69.6	1.06*	63.8	64.6	.99
Gurage	54.9	58.0	.95	66.1	56.9	1.16*
Tigraway	67.7	72.4	.94	65.5	62.4	1.05
Agew	77.9	65.9	1.18	66.6	64.9	1.03
Kimant	70.5	82.9	.85	65.3	75.0	.87
Oromo	68.4	60.7	1.13*	60.7	57.1	1.06
Borena	57.3	64.3	.89	38.7	28.6	1.35
Guji	83.9	52.0	1.61*	61.6	55.5	1.11
Konso	61.8	93.8	1.41	57.3	50.5	1.13
Sidamo	61.9	66.6	.93	71.1	72.9	.97
Gedeo	66.1	70.8	.93	67.7	63.1	1.07
Hadya	79.3	62.4	1.27*	73.0	72.9	1.00
Kembata	78.3	74.9	1.05	72.4	71.5	1.01
Ari/ara	58.0	53.0	1.09	46.6	51.0	.91
Gimera/She /Bench	56.0	60.2	.93	60.7	51.4	1.18
Kefa	74.1	69.0	1.07	66.9	50.0	1.33
Gamo	58.4	53.9	1.08	59.3	60.6	.98
Welaita	53.3	62.2	.86	70.2	65.6	1.07
Others	66.9	64.8	1.03	63.7	60.0	1.06
All Groups	69.0	64.8	1.06*	63.9	61.6	1.04*

1/ A ratio (also called "relative risk") of 1.0 indicates identical stunting rates in boys and girls; values above 1 indicate higher rates for boys and values below 1.0 indicate higher rates for girls.

*P<.05

Note : Number of Children in the Sample are provided in Appendix Table 9.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 23-Indicators of Caretaking Practices for Boys and Girls by Mother's Religion

Mother's Religion	6-23 Percent stunted				24-59 Percent stunted			
	Boys	Girls	Ratio	Prob	Boys	Girls	Ratio	Prob
Christian	69.5	65.9	1.05	.004	64.5	63.2	1.02	NS
Moslem	69.9	63.6	1.10	..07	62.7	60.5	1.04	NS
Pagan/ Atheist/ Other	62.3	57.6	1.08	NS	61.8	51.0	1.21	.008
All Religions	69.0	64.8	1.06	.0006	63.9	61.7	1.04	.036

Note : 1- NS = No Significant association
2- Number of Children in the Sample are provided in Appendex Table 10.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 24-Prevalence (in per cent) and Duration of Illness in Prior Two Weeks

Duration	Age in months				
	6-11	12-23	24-35	36-59	All Ages
Not sick	56.1	54.4	60.7	67.3	61.7
Sick 1-4 Days	13.0	15.8	13.3	11.8	13.1
Sick 3-7 Days	14.1	12.2	10.8	8.4	10.4
Sick 8-14 Days	16.8	17.6	15.2	12.5	14.7
Total Sick	43.9	45.6	39.3	32.7	38.2
Number of Children in the Sample size	2,725	4,884	4,537	9,331	21,477

Source: 1992 Rural National Nutrition Survey, CSA.

Table 25- Prevalence (in per cent) and Type of Illness by Child's Age

Illness	Age in months				
	6-11	12-23	24-35	36-59	All Ages
Kwashiokor (edema)	0.7	0.8	1.0	1.3	1.0
Diarrhea	10.6	14.3	9.4	4.8	8.6
Vomiting	3.0	2.7	2.5	2.5	2.6
Diarrhea+ Vomiting	6.0	6.1	4.6	2.1	4.0
Fever	9.2	8.6	9.1	8.2	8.5
Malaria	0.9	1.0	1.0	1.5	1.2
Whooping cough	1.8	1.4	1.3	1.3	1.4
Other cough	2.5	2.6	3.6	3.7	3.3
Measles	0.7	0.7	0.8	0.7	0.7
Other	8.4	7.4	6.0	6.5	6.8
Not sick	56.1	54.4	60.7	67.3	61.7
Total	100.0	100.0	100.0	100.0	100.0

Source: 1992 Rural National Nutrition Survey, CSA

Table 26-Prevalence (in per cent) and Type of Illness in Prior 14 Days, by Region

Region	Ill	Type of illness									
		Diarrhea	Vomiting	Fever	Malaria	Whoop cough	Other cough	Measles	Other	Not sick	Total
Arsi	40.1	11.4	3.3	8.1	0.1	1.5	4.5	0.1	11.3	59.9	100
Bale	31.2	12.3	2.5	7.5	0.5	0.7	3.1	-	4.7	68.8	100
N. Omo	46.0	16.3	2.6	11.5	3.4	1.4	2.8	0.5	7.7	54.0	100
S. Omo	42.4	13.1	2.8	9.5	1.4	1.0	3.2	1.8	9.5	57.6	100
E. Gojam	31.2	11.5	1.9	7.1	0.7	0.9	2.2	0.4	6.6	68.8	100
W. Gojam	43.4	9.4	1.6	5.8	1.5	0.9	3.6	-	10.5	66.6	100
Metekel	54.5	16.4	3.0	11.7	4.8	2.6	6.9	-	7.9	46.5	100
N.Gonder	49.9	8.8	2.9	18.8	0.3	1.5	6.0	0.6	11.2	50.1	100
S.Gonder	46.3	13.5	4.3	12.7	0.1	2.2	4.4	0.1	8.9	53.7	100
Ilubabor	46.0	14.4	3.5	6.2	0.4	0.9	4.8	0.7	12.0	59.9	100
Kefa	40.1	11.9	3.3	6.2	0.4	0.9	4.8	0.7	12.0	59.9	100
N.Shewa	18.7	5.0	1.4	5.9	0.2	0.5	2.5	-	2.2	82.3	100
E.Shewa	22.1	8.6	1.7	6.7	0.2	0.4	1.2	0.2	2.9	77.9	100
W.Shewa	29.1	11.4	2.0	5.3	0.2	1.0	1.5	0.1	7.0	70.9	100
S.Shewa	36.6	11.7	2.4	10.1	2.0	1.0	2.8	1.5	5.0	63.4	100
A.Ababa	18.9	5.3	1.2	4.4	0.2	0.4	2.3	0.3	4.9	81.1	100
Sidamo	31.9	15.1	2.7	5.1	0.4	0.4	1.3	0.3	6.5	68.1	100
Borena	38.2	23.9	0.9	5.0	2.2	0.8	2.2	1.2	2.0	61.8	100
Tigray	60.5	16.6	2.8	12.5	2.2	5.0	9.0	5.6	6.7	39.5	100
Welega	42.4	12.6	3.0	9.5	-	1.7	1.7	0.8	13.0	57.6	100
N.Welo	41.2	14.2	4.0	11.3	1.2	4.2	2.0	-	4.2	58.8	100
S.Welo	35.6	12.9	2.9	7.4	4.1	2.1	1.1	0.1	4.2	64.4	100
Total	38.2	12.6	2.6	8.5	1.2	1.4	3.2	0.7	7.8	61.7	100

Note: 1- Diarrhea can be with or without vomiting; "Vomiting" represents vomiting alone.
2- Row may not sum to 100 due to missing values, rounding, and exclusion of minor categories; "other" includes Kwashiokor.

Source: 1992 Rural National Nurition Survey, CSA.

Table 27-Prevalence (in per cent) and Type of Illness in Prior 14 Days, by Source of Household Income

Primary Source of household Income	Ill	Type of illness								Not sick	Total
		Diarrhea	Vomiting	Fever	Malaria	Whoop cough	Other cough	Measles	Other		
Cereals	38.5	11.9	2.5	8.9	1.2	1.8	3.5	0.7	7.8	61.5	100
Roots	33.4	16.4	3.2	5.4	0.3	0.6	1.8	0.5	5.4	66.6	100
Cattle	42.8	27.4	2.2	4.1	1.7	0.6	4.3	1.2	1.5	57.2	100
Chat	39.6	18.4	2.1	6.9	-	-	6.2	-	6.0	60.4	100
Coffee	35.4	14.0	3.9	5.1	0.5	0.5	1.7	0.8	8.9	64.6	100
Other cash crop	33.4	14.7	-	10.3	1.1	-	-	1.1	6.9	66.6	100
Daily labor	41.9	17.5	2.0	6.9	0.2	1.4	3.7	-	10.1	58.1	100
Fuel sales	36.2	16.2	2.8	9.2	-	0.9	4.9	-	2.2	63.8	100
Crafts	43.0	18.3	3.3	6.4	0.8	1.0	2.0	1.1	10.1	57.0	100
Trade	45.7	18.2	2.6	9.8	0.8	0.2	4.0	0.3	9.7	54.3	100
Civil service	31.3	10.5	3.0	5.3	2.8	2.1	1.4	0.7	5.6	68.7	100
cereal + roots	43.0	13.5	3.3	11.5	1.4	0.5	3.2	1.1	8.5	57.0	100
Cereal + cattle	33.9	11.0	2.3	7.8	1.8	1.0	2.9	0.6	6.6	66.1	100
Root + cattle	29.2	14.2	3.4	4.2	0.3	0.5	0.8	0.4	5.3	70.8	100
Other	38.0	12.9	2.0	7.8	0.9	0.6	2.7	0.8	10.2	62.0	100
All Sources	38.2	12.6	2.6	8.5	1.2	1.4	3.2	0.7	7.8	62.0	100

Note: 1- Same as Table 21
2- Same as Table 21

Source: 1992 Rural National Nutrition Survey, CSA

Table 28- Primary Endemic Diseases as Perceived by Health Staff at Farmers Association Level, by Region

Region	Endemic Disease									
	PEM*	Malaria	Diarrhea	Abdo. Para.	Whoop cough	TB+ Resp.	Skin	Leprosy	Other	Total
Arsi	1.8	16.6	5.8	21.0	-	35.3	-	-	19.6	100
Bale	15.6	-	9.5	24.3	-	10.1	-	14.0	26.4	100
N. Omo	-	63.2	6.4	24.4	-	-	3.2	1.1	1.7	100
S. Omo	12.9	10.9	10.2	6.4	9.2	15.3	19.1	8.2	7.7	100
E. Gojam	-	37.6	12.4	-	-	50.0	-	-	-	100
W. Gojam	-	67.6	5.6	-	-	2.8	-	-	24.0	100
Metekel	-	82.9	13.3	-	-	3.8	-		-	100
N. Gonder	-	34.9	-	38.2	-	23.9	-	3.0	-	100
S. Gonder	-	45.6	-	-	-	20.3	-	-	34.1	100
Ilubabor	8.5	48.4	10.5	21.8	-	6.0	-	-	4.8	100
Kefa	-	29.5	6.7	43.4	-	5.9	3.4	-	11.1	100
N. Shewa	35.5	-	-	-	-	64.5	-	-	-	100
E. Shewa	-	77.3	8.6	7.4	-	-	-	-	6.7	100
W. Shewa	-	16.1	33.8	-	-	19.0	-	-	31.1	100
S. Shewa	1.9	42.7	22.7	7.7	7.2	14.9	-	-	7.9	100
A. Ababa	-	51.1	18.4	-	-	30.5	-	-	-	100
Sidamo	2.6	31.7	28.0	20.6	-	3.9	-	4.9	8.3	100
Borena	-	30.1	9.0	-	-	-	-	-	60.9	100
Tigray	2.6	78.4	-	-	3.3	15.7	-	-	-	100
Welega	-	35.0	6.2	30.8	-	26.7	1.3	-	-	100
N. Welo	-	34.5	59.4	3.3	-	2.9	-	-	-	100
S. Welo	15.4	54.5	5.7	5.8	4.0	14.7	-	-	-	100
Total	3.0	43.3	11.5	14.3	.7	15.0	.6	1.0	10.6	100

*PEM includes Nutritional deficiencies (such as Vit A. Goiter and others

Source: 1992 Rural National Nutrition Servey, CSA.

Table 29- Water Source by Region

Region	Water Source					
	Pipe/ prot. well	Spring/ unprot. well	River	Lake/ Pond	Other	Total
Arsi	1.0	29.8	53.1	16.1	0.0	100
Bale	27.9	27.9	35.5	8.2	0.6	100
N. Omo	4.6	37.0	58.0	0.3	0.1	100
S. Omo	5.9	39.7	54.4	0.0	0.0	100
E. Gojam	3.5	68.9	26.0	1.4	0.2	100
W. Gojam	3.3	44.7	49.4	2.6	0.0	100
Metekel	25.4	31.0	43.4	0.3	0.0	100
N. Gonder	0.0	59.4	37.1	3.5	0.0	100
S. Gonder	0.4	56.0	43.5	0.1	0.0	100
Ilubabor	5.8	69.7	20.6	2.9	1.0	100
Kefa	10.4	58.0	31.5	0.1	0.0	100
N. Shewa	3.9	78.5	17.0	0.4	0.3	100
E. Shewa	16.9	20.4	36.2	5.5	21.0	100
W. Shewa	2.1	47.0	50.5	0.1	0.3	100
S. Shewa	0.1	32.9	48.9	15.6	2.5	100
A. Ababa	4.0	44.0	39.9	12.2	0.0	100
Sidamo	9.7	46.1	29.4	14.3	0.5	100
Borena	3.1	46.0	30.5	20.4	0.0	100
Tigray	0.2	66.5	24.8	8.6	0.0	100
Welega	3.5	55.2	41.1	0.2	0.0	100
N. Welo	0.9	63.2	33.8	2.1	0.0	100
S. Welo	7.6	75.1	16.5	0.8	0.0	100
Total	4.5	51.4	37.6	5.8	.8	100

Source: 1992 Rural National Nutrition Survey, CSA.

Table 30- Water Source by Primary Source of Household Income

Primary Source of Household Income	Water source					
	Pipe/ protected well	Spring/ unprotected well	River	Lake/ Pond	Other	Total
Cereals	4.6	52.6	36.9	4.8	1.1	100
Roots	6.4	41.9	37.7	13.7	0.4	100
Cattle	3.7	56.8	30.6	8.1	0.8	100
Chat	0.0	47.3	46.3	6.4	0.0	100
Coffee	5.4	55.6	28.3	10.7	0.0	100
Other cash crop	1.8	15.5	57.2	25.6	0.0	100
Daily labor	11.6	41.6	42.9	3.3	0.6	100
Fuel sales	5.7	45.9	35.9	12.5	0.0	100
Crafts	4.8	51.2	40.8	3.2	0.0	100
Trade	7.5	44.8	39.1	8.5	0.1	100
Civil service	16.1	50.9	31.0	1.7	0.2	100
Cereal + roots	1.2	47.8	48.2	2.4	0.4	100
Cereal + Cattle	3.0	53.3	35.0	8.6	0.2	100
Root + cattle	1.4	36.1	37.0	17.5	2.1	100
Other	5.9	49.6	41.6	2.1	0.7	10
Total	4.5	51.4	37.6	5.8	0.8	100

Source: 1992 Rural National Nutrition Survey, CSA.

Table 31- Percent of Children Still Breastfed at Various Ages* by Region

Region	Percent still breastfeeding at end of month:										Median Duration of B.Feeding
	3	6	9	12	15	18	21	24	30	36	
Arsi	97	95	93	81	74	56	50	19	7	1	23.8
Bale	97	93	81	71	62	43	35	15	7	5	19.9
N. Omo	98	95	89	72	65	47	40	23	14	4	20.5
S. Omo	99	95	93	81	72	55	47	27	10	5	23.0
E. Gojam	99	99	99	93	90	78	74	44	23	7	26.4
W. Gojam	99	99	99	97	94	81	77	47	27	6	26.7
Metekel	99	98	97	90	86	75	72	42	23	6	26.2
N. Gonder	99	99	99	95	94	84	80	53	27	7	28.0
S. Gonder	99	99	99	96	94	87	80	56	28	9	29.0
Ilubabor	98	97	96	90	87	73	69	30	13	3	25.4
Kefa	98	95	92	80	77	63	59	34	22	15	25.1
N. Shewa	97	95	93	90	88	77	71	49	29	7	26.8
E. Shewa	97	95	94	84	79	71	67	44	34	23	26.2
W. Shewa	97	94	93	86	84	64	59	26	14	4	24.8
S. Shewa	99	98	97	86	77	60	56	22	11	2	24.5
A. Ababa	93	91	90	81	77	65	63	30	19	7	25.1
Sidamo	99	98	94	80	68	51	44	16	9	2	21.3
Borena	98	98	95	79	63	40	31	15	11	8	19.7
Tigray	99	99	99	92	90	75	72	35	17	2	25.8
Welega	98	96	96	87	82	66	62	29	15	2	25.1
N. Welo	99	98	98	95	92	82	79	47	24	9	26.7
S. Welo	99	99	98	92	88	73	68	42	27	18	26.1
All Regions	98	97	95	87	81	67	62	35	22	11	25.3

*Results based on survival analysis.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 32- Percent of Children Still Exclusively Breastfed at Various Age by Region*

Region	Percent Still Exclusively Breastfed at end of months:												Median Duration of Exclusive B.Feeding
	1	2	3	4	5	6	7	8	9	10	11	12	
Arsi	83	75	68	60	56	35	28	20	16	12	12	3	6.3
Bale	85	77	70	59	56	4	34	22	14	9	7	1	6.4
N.Omo	80	62	45	32	22	5	2	1	1	0	0	0	3.7
S.Omo	100	99	89	60	38	10	5	3	1	0	0	0	5.5
E.Gojam	99	99	98	97	96	81	70	54	44	36	31	9	9.4
W.Gojam	98	97	95	94	92	76	68	53	43	35	33	8	9.3
Metekel	97	92	89	86	83	63	51	41	34	28	26	3	8.1
N.Gonder	99	99	99	98	96	75	70	61	57	54	53	22	12.1
S.Gonder	98	96	95	94	94	78	71	63	57	50	46	16	10.7
Ilubabor	89	79	64	54	49	27	18	13	11	10	9	5	5.8
Kefa	89	81	76	71	65	45	36	27	22	20	19	5	6.8
N.Shewa	86	80	76	72	70	51	36	22	20	17	14	2	7.1
E.Shewa	74	90	86	82	79	60	54	40	36	29	28	6	8.3
W.Shewa	85	61	51	47	44	3	26	19	17	15	15	2	4.3
S.Shewa	96	90	86	77	68	56	43	30	26	20	19	6	7.5
A.Ababa	88	80	74	71	69	49	43	31	25	22	22	4	7.0
Sidamo	99	98	95	86	79	59	46	32	26	18	15	4	7.7
Borena	100	99	98	96	96	86	63	43	37	27	24	9	8.7
Tigray	99	99	98	98	96	74	70	64	61	59	58	22	12.7
Welega	94	90	89	84	78	42	28	16	13	11	11	2	6.8
N.Welo	100	99	99	98	96	81	73	61	55	47	44	16	10.7
S.Welo	99	99	95	89	82	56	45	30	24	21	20	6	7.6
Total	99	99	98	98	96	74	70	64	61	59	58	22	7.1

*Result based on survival analysis.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 33- Percentage distribution of Initiation of Breastfeeding by Region

Region	Hours after birth						Total
	<1	1-6	7-12	13-24	>24	Never	
Arsi	26.3	55.4	10.0	4.5	3.2	0.5	100
Bale	29.1	48.5	11.1	5.3	5.8	0.3	100
N. Omo	29.8	60.4	6.3	1.8	1.1	0.2	100
S. Omo	74.0	17.3	3.8	2.4	2.5	0.0	100
E. Gojam	2.4	38.2	30.7	17.6	10.9	0.2	100
W. Gojam	22.6	61.1	11.1	3.2	2.0	0.0	100
Metekel	19.9	45.2	10.0	10.9	14.0	0.0	100
N. Gonder	21.8	45.9	16.6	7.7	2.8	0.1	100
S. Gonder	16.3	43.3	21.0	12.4	6.8	0.2	100
Ilubabor	32.6	51.3	2.9	4.3	3.6	0.3	100
Kefa	44.3	36.6	6.1	6.3	6.3	0.4	100
N. Shewa	18.1	38.9	15.4	7.9	19.5	0.8	100
E. Shewa	41.7	45.2	6.2	2.5	4.3	0.5	100
W. Shewa	35.9	55.5	6.5	1.2	1.5	0.1	100
S. Shewa	30.6	55.4	7.4	4.7	1.9	0.0	100
A. Ababa	44.5	45.9	4.3	2.0	2.5	0.8	100
Sidamo	67.3	30.2	1.4	0.7	0.4	0.0	100
Borena	53.8	28.9	4.6	3.2	9.5	0.0	100
Tigray	29.2	24.2	14.6	11.8	20.0	0.2	100
Welega	32.7	53.2	8.7	2.9	2.3	0.2	100
N. Welo	8.5	14.0	16.9	17.5	42.7	0.4	100
S. Welo	1.2	9.4	12.2	21.0	55.9	0.4	100
Total	29.7	24.2	14.6	11.8	20.0	0.2	100

Source: 1992 Rural National Nutrition Survey, CSA.

Table 34- Type of First Foods/Liquids Green After Birth by Region

Region	First food/liquid given						
	Breast milk	Warm water	Butter	fenu Greek	Milk	Other	Total
Arsi	39.7	14.2	42.4	0.0	2.6	1.1	100
Bale	14.3	27.6	40.0	0.0	13.0	5.1	100
N. Omo	56.9	22.8	2.6	0.1	0.2	17.4	100
S. Omo	73.9	9.5	5.6	0.2	0.2	10.7	100
E. Gojam	10.1	0.5	89.1	0.1	0.1	0.1	100
W. Gojam	11.7	0.0	85.4	0.1	0.0	2.9	100
Metekel	39.1	0.3	56.5	0.0	0.0	4.0	100
N. Gonder	4.7	0.0	93.6	0.1	0.3	1.2	100
S. Gonder	13.1	1.9	84.6	0.0	0.0	7.9	100
Ilubabor	68.6	4.8	24.5	0.5	1.0	0.6	100
Kefa	51.6	2.4	38.6	0.0	3.1	4.3	100
N. Shewa	1.6	1.6	96.1	0.0	0.1	0.5	100
E. Shewa	17.6	14.2	67.4	0.0	0.1	0.7	100
W. Shewa	27.5	3.3	63.0	0.2	1.8	4.2	100
S. Shewa	45.1	27.1	19.7	1.0	3.4	3.6	100
A. Ababa	7.0	5.6	86.6	0.5	0.0	0.2	100
Sidamo	63.6	23.8	4.0	0.0	0.7	7.9	100
Borena	36.7	43.0	1.2	0.0	12.9	6.2	100
Tigray	31.5	7.7	49.6	0.1	0.1	11.1	100
Welega	73.1	1.6	23.2	0.1	0.5	1.5	100
N. Welo	1.7	3.3	87.2	0.0	0.0	7.9	100
S. Welo	1.2	4.1	73.7	0.0	1.0	19.9	100
Total	33.8	10.8	48.2	0.2	1.6	5.5	100

Source: 1992 Rural National Nutrition Survey, CSA.

Table 35- Percent of Children Still Breastfed at Various Ages[1] by source of Household Income

Primary Source of Household Income	Percent still breastfed at end of months: 3	6	9	12	15	18	21	24	30	36	Median Duration of B.Feeding
Cereals	99	97	95	87	82	67	62	33	17	5	25.2
Roots	99	98	93	80	73	57	49	14	7	2	23.7
Cattle	98	97	97	92	76	62	56	19	15	6	24.5
Chat	94	90	85	82	82	70	67	16	5	1	25.0
Coffee	97	95	90	81	72	53	49	21	13	4	23.1
Other cash crop	94	94	94	88	88	80	66	15	15	15	25.0
Daily labour	99	98	97	88	84	70	66	39	27	13	25.8
Fuel sales	99	95	89	77	73	66	57	31	21	8	24.8
Crafts	99	98	97	78	76	60	55	26	18	5	24.6
Traders	96	95	94	80	69	60	56	30	18	9	24.7
Civil service	95	9	91	81	80	57	53	25	13	9	24.3
Cereal + root	98	97	95	83	76	59	52	26	13	4	24.2
Cereal + cattle	98	97	96	87	82	65	61	33	20	9	25.2
Root + cattle	95	93	91	78	75	52	46	18	11	2	22.0
Others	98	97	94	82	76	60	56	28	14	5	24.7
All Sources	98	97	94	82	81	67	62	35	22	11	25.3

[1] Results based on survival analysis.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 36- Percent of Children Still Exclusively Breastfed, by Age and Source of Household Income

Primary Source of Household Income	Children Still Exclusively Breastfed at months:												Median Duration of B.Feeding
	1	2	3	4	5	6	7	8	9	10	11	12	
Cereals	92	87	82	77	73	54	44	34	30	26	24	7	7.4
Roots	98	92	85	80	74	57	47	34	29	23	21	3	7.7
Cattle	96	94	91	87	87	73	66	57	52	43	35	15	10.2
Chat	90	75	61	55	50	40	30	19	19	19	19	4	6.0
Coffee	99	98	96	89	82	62	47	31	24	16	15	6	7.8
Other cash crop	95	91	88	89	79	60	53	39	36	23	23	9	8.2
Daily labor	97	92	82	79	78	62	51	39	34	28	26	5	8.1
Fuel sales	89	83	78	77	71	45	41	31	27	17	15	2	6.8
Crafts	90	83	76	69	66	47	40	29	24	22	19	6	6.9
Traders	92	86	81	78	72	53	41	26	21	17	15	3	7.2
Civil service	99	97	88	69	62	38	30	20	18	16	14	2	6.5
Cereal + root	86	70	62	52	42	28	20	14	10	8	7	4	5.2
Cereal + cattle	91	85	79	73	68	50	42	31	26	21	19	5	7.1
Root + cattle	98	81	68	60	51	32	24	19	15	14	12	3	6.1
Others	95	88	80	69	61	39	34	27	24	17	16	6	6.5
Total	92	86	80	74	70	51	42	31	27	23	21	6	7.1

*Results based on servival analysis.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 37- Initiation of Breastfeeding by Source of Household Income

Primary Source of Household Income	Hours After Birth						
	<1	1-6	7-12	13-24	>24	Never	Total
Cereals	25.3	44.2	12.4	7.4	10.4	0.2	100
Roots	71.3	23.7	2.9	0.9	1.3	0.0	100
Cattle	43.7	27.1	9.1	3.8	16.2	0.0	100
Chat	45.2	50.5	4.0	0.0	0.2	0.0	100
Coffee	59.5	36.5	2.9	0.4	0.7	0.0	100
Other Cash Crop	82.4	17.6	0.0	0.0	0.0	0.0	100
Daily Labor	33.4	38.2	10.1	7.7	10.4	0.2	100
Fuel Sales	33.8	50.9	9.0	3.3	3.0	0.0	100
Crafts	30.3	47.8	6.5	5.9	9.5	0.0	100
Traders	41.8	42.1	9.7	3.5	2.8	0.1	100
Civil Service	26.3	36.0	11.7	7.8	18.2	0.0	100
Cereal+Root	39.3	51.8	5.5	2.2	1.1	0.2	100
Cereal+Cattle	24.2	41.8	10.9	8.5	14.3	0.3	100
Root+Cattle	47.7	48.0	2.3	1.0	0.9	0.0	100
Others	36.5	51.4	4.2	3.6	4.1	0.1	100
All Sources	29.7	43.8	10.5	6.5	9.3	0.2	100

Source: 1992 Rural National Nutrition Survey, CSA.

Table 38- Type of First Food/Liquid Given After Birth, by Source of Household Income

Primary Source of Household income	First Food Liquid Given						
	Breastmilk	Warm water	Butter	Fenu	Milk	Other	Total
Cereals	30.0	7.8	56.6	0.1	1.4	4.0	100
Roots	51.4	13.0	13.4	0.1	0.4	21.7	100
Cattle	23.8	38.4	10.7	0.0	20.2	6.8	100
Chat	64.6	4.0	13.7	0.0	0.9	16.8	100
Coffe	63.3	25.9	8.6	0.3	1.6	0.3	100
Other Cas Crop	73.3	21.9	4.8	0.0	0.0	0.0	100
Dailly Labor	34.9	9.4	42.9	0.5	0.8	11.5	100
Fuel Sales	39.3	14.6	40.2	0.0	3.0	2.9	100
Crafts	38.0	9.1	41.7	0.0	1.9	9.3	100
Traders	36.6	17.0	39.8	0.0	1.6	4.9	100
Civil Service	42.1	17.1	22.7	0.0	0.0	18.1	100
Cereal + Root	49.6	23.0	18.1	0.0	1.3	7.9	100
Cereal+Cattle	25.1	11.9	54.2	0.5	1.8	6.5	100
Root + Cattle	50.0	10.5	28.1	0.0	2.7	8.7	100
Others	53.4	11.0	29.0	0.3	0.8	5.5	100
All Sources	33.8	10.8	48.2	0.2	1.6	5.5	100

Source: 1992 Rural National Nutrition Survey, CSA.

Table 39- Distribution of Children by Types of Foods Eaten in Prior Month by Child's Age

Food*	Age in Months								
	0-1	2-3	4-5	6-7	8-9	10-11	12-23	24-35	≥36
Exclusive Breastfeeding	94.4	84.6	75.4	51.8	35.3	29.1	9.5	0.0	0.0
Milk	4.4	11.7	15.9	25.5	20.5	15.3	7.3	2.7	0.9
Cereals	0.1	1.0	3.0	10.7	19.3	23.6	37.3	42.5	46.8
Enset/Roots	0.0	0.0	0.3	0.3	0.1	0.7	1.2	1.7	2.5
Vag/Fruit	0.0	0.0	0.0	0.0	0.6	0.7	0.8	0.4	0.9
Milk & Solids	0.7	2.4	4.2	9.8	19.9	24.0	34.0	40.0	34.5
Cereal+Others Solids	0.0	0.0	0.4	0.7	1.1	2.6	4.4	7.1	9.3
Enset & Fruit/Veg.	0.0	0.0	0.0	0.0	0.0	0.2	0.8	1.1	1.7
Multimix	0.3	0.3	0.9	1.1	3.7	3.7	4.5	4.4	3.4
All Types	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* All food types typically include breastmil in the first year of life

Source: 1992 Rural National Nutrition Survey, CSA.

Table 40- Percent of Children Correctly Recognized as Wasted by their Mothers by Region and Age of Child*

Region	6-23 Months			24-59 Months		
	Percent Wasted	Number	Percent recognized	Percent Wasted	Number	Percent Recognized
Arsi	7.4	26	71.1	3.1	21	42.6
Bale	7.5	20	51.1	2.9	17	43.7
North Omo	8.5	37	57.5	7.8	66	31.5
South Omo	12.8	16	45.1	3.9	10	34.7
East Gojam	18.7	69	59.0	10.2	66	55.2
West Gojam	8.7	32	41.3	7.7	51	40.6
Metekel	(4.6	7	45.5)	7.6	23	68.6
North Gonder	13.1	45	73.3	4.8	30	36.1
South Gonder	15.3	33	69.4	6.6	27	58.2
Ilubabor	12.8	56	62.3	6.9	60	52.8
Kefa	6.4	30	57.5	7.8	66	31.5
North Shewa	(3.3	5	16.2)	6.3	16	25.4
East Shewa	7.8	21	45.7	4.4	26	23.9
West Shewa	7.7	33	59.7	3.9	31	45.9
South Shewa	5.7	25	37.5	6.6	48	54.8
Addis Ababa	9.3	26	60.6	2.9	17	31.4
Sidamo	8.7	42	47.7	10.8	103	48.5
Borena	10.1	20	26.7	13.8	66	33.9
Tigray	19.5	75	74.5	11.8	91	69.0
Welega	14.3	32	73.4	8.9	47	66.0
North Welo	10.4	25	59.0	7.8	33	55.9
South Welo	6.7	18	48.1	4.3	24	56.5
All Regions	9.8	693	59.1	7.0	925	50.9

* Wasting defined as weight for height less than -2 Z-scores. Number refers to the number wasted who answered the question. Regions with very small sample sizes (< 10) are in brackets

Source: 1992 Rural National Nutrition Survey, CSA.

Table 41- Percent of Children Correctly Recognized as Wasted by Their Mothers, by Source of Household Income and Age of Child*

Primary Source of Household Income	6-23 Months			24-59 Months		
	Percent Wasted	Number	Percent Recognized	Percent wasted	Number	Percent Recognized
Cereals	10.2	442	62.1	7.0	546	52.1
Roots	9.0	16	40.5	10.3	31	39.8
Cattle	(15.0	6	47.0)	5.5	11	51.8
Chat	(20.9	4	72.3)	(4.6	2	29.5)
Coffee	8.0	17	51.6	11.8	48	59.1
Other Cash Crop	(13.0	1	0.0)	(7.5	2	100.0)
Daily Labor	13.7	10	67.9	6.8	12	100.0
Fuel Sales	(3.0	1	0.0)	(8.5	5	79.8)
Crafts	(7.0	8	90.5)	(5.4	7	78.6)
Traders	10.8	12	35.3	8.1	18	55.3
Civil Service	(9.0	7	54.9)	(3.2	3	32.0)
Cereal + Root	7.2	35	43.7	6.2	70	47.5
Cereal+Cattle	9.4	97	57.3	6.0	105	41.0
Root + Cattle	(9.7	8	59.3)	9.1	15	39.9
Others	8.7	29	54.5	8.0	48	58.9
All Sources	9.8	693	59.1	7.0	923	51.0

* Wasting defined as weight for height less than -2 Z-scores. Number refers to the number of wasted children's mothers who answered the question. Groups with very small sample sizes (< 10) are in brackets.

Source: 1992 Rural National Nutrition Survey, CSA.

Table 42- Indicators of the Situation of Mother's , by Region

Region	Percent of Mother's 3 under-5's	Age <20	Educ.=0	Father Educ.=0	Managing HH	Mean Score *
Arsi	8.7	6.4	90.4	61.8	14.2	1.81
Bale	13.2	2.2	83.5	47.8	16.5	1.62
North Omo	8.4	2.5	92.0	69.7	17.6	1.87
South Omo	7.1	3.4	93.3	70.5	13.0	1.84
East Gojam	1.8	6.3	96.3	60.5	11.8	1.76
West Gojam	2.5	7.7	95.4	67.4	14.0	1.86
Metekel	9.0	5.1	96.4	75.5	14.6	1.95
North Gonder	2.1	10.6	94.2	65.1	16.1	1.86
South Gonder	1.9	7.7	97.4	75.0	13.0	1.94
Ilubabor	9.9	3.0	90.2	65.1	12.0	1.78
Kefa	10.1	4.8	91.9	72.8	17.5	1.96
North Shewa	10.3	6.0	95.0	63.1	16.9	1.90
East Shewa	8.0	6.5	90.0	70.9	15.2	1.89
West Shewa	9.4	2.9	93.7	63.3	17.4	1.85
South Shewa	9.9	2.6	86.6	56.5	16.9	1.71
Addis Ababa	10.9	4.9	91.2	68.0	21.8	1.94
Sidamo	8.1	4.5	88.1	58.0	19.2	1.72
Borena	20.2	1.1	97.0	68.2	16.2	2.03
Tigray	6.1	3.9	97.5	72.8	18.6	1.98
Welega	6.3	2.6	92.5	58.9	19.3	1.78
North Welo	5.7	2.0	99.1	72.5	17.5	1.91
South Welo	6.9	5.7	85.4	59.4	13.3	1.69
All Region	7.7	4.6	91.9	64.1	15.7	1.87

Source: NNSS National Survey March, 1992 (CSA)

* The mean score represents the average of risk factors possessed by women in the region, based on the five factors show in this Table.

Table 43- Indicators of the Situation of Women, by Source of Household Income

Primary Source of Household Income	Percent of Mother's 3 under 5's	Age <20	Edic.=0	Father's Educ.=0	Managing Hit	Mean Score*
Cereals	7.2	5.4	93.5	65.8	14.7	1.85
Roots	9.5	5.00	93.6	61.2	15.8	1.81
Cattle	10.4	2.9	93.4	80.8	40.4	2.28
Chat	13.5	3.5	91.0	59.7	18.3	1.84
Coffee	3.4	5.1	82.4	46.5	14.0	1.50
Other Casch Crop	0	0	94.3	66.9	10.0	1.70
Daily Labor	6.1	4.8	93.9	69.8	34.3	2.08
Fuel Sales	7.9	1.7	91.3	75.3	53.9	2.29
Crafts	8.6	4.1	91.1	60.7	28.7	1.92
Traders	8.7	1.8	81.4	51.9	38.8	1.80
Civil Service	4.8	3.1	34.5	10.6	8.4	.61
Cereal+Root	10.4	1.8	90.0	66.6	12.7	1.80
Cereal+Cattle	7.6	3.7	92.4	63.3	13.8	1.80
Root+Cattle	12.4	1.1	94.2	74.1	12.7	1.92
Others	8.5	3.9	86.3	53.0	19.8	1.70
All Sources	7.7	4.6	91.9	69.1	15.7	1.83

Source: NNSS National Survey March, 1992 (CSA)

* See footnote to Table 35.

APPENDIX 1

Criteria and Rationale for Choosing Structural Variables for Classification Analysis

In deciding the types of classifications to present in this report, a distinction was made between "structural" and "behavioral" variables. The characteristics of these two categories of variables are described below, followed by a brief explanation of why these two categories should be distinguished in this and future reports.

Characteristics and Criteria for selecting the structural variables:

1. They are permanent or semi-permanent characteristics of households.

2. They distinguish population groups which are easily recognized and which government may find useful to distinguish for policy formulation.

3. They distinguish population groups which are likely to be affected differently by various government policies; this opens the possibility to target actions selectively to certain groups and permits a policy analysis and review (i.e., assessment, evaluation, ...etc) to be undertaken in a disaggregated fashion.

4. Due to the potential importance of economic policy reforms for nutritional well-being, preference is given to characteristics which reflect variation in economic roles and functions within society.

5. The collection of structural variables should not be so numerous as to overwhelm policy analysts and planners; however, in the absence of an agreed upon set of structural variables, the

present report has adopted several variables in the hope that: (a) they may be useful to some users; and (b) they may stimulate others to discuss the categories most meaningful to their own application, and to propose these to members of the NTCNS.

6. Finally, it should be stressed that the adoption of structural variables does not imply that these variables are necessarily causally related to the observed variations in nutritional status. Rather, they are operationally convenient variables upon which the population can be stratified and which may prove useful for guiding policy analysis and review.

By contrast, behavioral variables have the following characteristics:

1. They represent characteristics which are under greater control of households and communities, and which may also respond to government action.

2. They are often "intermediate" variables between structural variables and nutritional outcomes, i.e., "mechanisms" by which government action may influence nutrition.

3. They should reflect characteristics or processes identified in the conceptual framework describing the causes of malnutrition.

4. Ideally, it should be possible to monitor behavioral variables in some fashion in the core module of the NNSS, even if this requires the use of proxy variables.

5. In light of the often subtle and complex nature of behavioral variables (e.g. household coping strategies, child feeding and care, hygienic practices, environmental sanitation), the assessment of their relationships to each other, to

nutritional status and to various policy options may often require more detailed studies of a qualitative or quantitative nature (e.g., the rapid assessments and in-depth studies making up the other components of the NNSS).

Although the above criteria appear straightforward in principle, the distinction between structural and behavioral variables is often difficult to make in practice. A good example is the area of land cultivated by a household. This can be considered a structural variable in those communities which have land shortages, because the household has little or no ability to expand the area under cultivation. However, in communities without land constraints, the size of cultivated area to a large extent reflects decisions and preferences of the household concerning economic strategies and the use of household labor, in which case it is a behavioral variable. This is a relevant example for the present report, because cultivated area is used as structural variable in some cases. In order to assist in its interpretation, this is accompanied by regional breakdowns whenever possible. This will allow cultivated area to be interpreted as a structural variable in those regions known to be suferring from land constraints, and a mixture of structural and behavioral variables in other regions.

Apart from being operationally useful, the distinction between structural and behavioral variables is also important because the failure to respect this distinction can produce spurious, misleading or wrong results in the empirical analysis if fairly sophisticated statistical procedures are not applied. A simple example is that mothers who attend health clinics frequently (a behavioral variable) may be found to have children that are more malnourished than those who attend infrequently. If interpreted in a simple-minded fashion, this could produce the erroneous conclusion that clinic attendance causes malnutrition, possibly because of inappropriate advice and/or treatment provided at such clinics. Although this would be recognized as a wrong conclusion

in this example, in many other cases it may be less obvious whether or not the result should be taken at face value.

Due to these technical issues, the prudent approach is for the NNSS to restrict its focus to the way in which malnutrition and selected behavioral variables vary across groups defined on the basis of structural variables. The analysis of relationships among behavioral variables, or between behavioral variables and malnutrition, should be left as a matter for research and should be fostered by the NNSS if such analyses are considered to be relevant to policy.

APPENDIX 2

VALIDITY CHECKS PERFORMED ON ANTHROPOMETRIC DATA, WITH SPECIAL REFERENCE TO COMPARABILITY WITH 1983 DATA

Prior to undertaking the analysis, a series of investigations in to the data were conducted to assess the quality of the age and anthropometry data, and especially to ensure that any cleaning and trimming procedures were consistent with the 1983 procedures.

1. Examination of Frequency Distributions: The distributions for HAZ, WAZ and WHZ were examined to identify any gross outliers. Rather than using an arbitrary cut-off point, special attention was given to the natural asymptotes of the distributions. This principle led to the exclusion of a small number of cases for each indicator based on the following cut-off points: HAZ (-8, +4), WAZ (-5, +2) and WHZ (-5, +5). The number of exclusions in each case were very few (<2%) and would not affect the means or prevalence estimates at national or regional level. The rationale for excluding them was to avoid any undue influence of these outliers on highly disaggregated analysis, when the sample sizes can become rather small.

In the 1983 survey the data were analyzed without any trimming of the distributions. Thus the cleaning procedures in the two surveys were essentially identical with respect to comparing means and prevalences at regional and national levels.

2. Examination of age heaping: In order to asses the quality of the age reporting the distribution of reported ages was examined by month to detect any excess cases of ages falling in half years or full years. If there was no rounding off of ages to the nearest year or half year, and although the proportion for the first ages could slightly be higher, one would expect in general about 1.7 % of cases to fall on each month from 1 to 60 months of age . The actual percent of cases falling on each whole year was 3.0 (at 12 months), 3.2 (at 24 months), 3.9 (at 36 months) and 4.2 (at 48

months). (Note that the survey only included children below 60 months of age, so there is no data reported for 60 month-old children). Across the four years, then, a total of 14.3% of children had reported ages falling on an even year, comapred to an expected frequency of 6.7%. For half-year rounding error, the percents were as follows: 1.4% at 6 months, 2.5% at 18 months, 2.3% at 30 months, 2.3% at 42 months, and 2.5% at 54 months. Overall, 11% of children had reported ages on half-year months, comapred to 8.3% expected. Thus, there is minimal heaping on half-years and roughly twice the expected frequency on full-year intervals. This is comparable to or better than the results from national surveys in other developing countries, and should not have any major impact on prevalence estimates or means at regional or national levels. The degree of age heaping in the 1983 survey was not documented, and it is therefore difficult to compare the two surveys in this regard.

3. Examination of bivariate distributions: Apart from examining the frequency distributions for each indicator separately, it is possible to identify possible measurement errors by examining scatterplots of one indicator against another. Each of these plots should form a bivariate normal distribution around a regression line reflecting the biological relationship between the two variables. Individual points falling far outside this bivariate distribution are likely due to gross measurement or recording error in weight, height, age or more than one of these. Since these plots (not presented) did not reveal a large number of cases falling outside the expected space, and since the 1983 survey did not use this technique to identify outliers, it was decided not to exclude any outliers on the basis of these plots in order to preserve comparability with the 1983 survey as much as possible.

4. Examination of possble systematic error by enumerators: The final technique to investigate data quality was to aggregate the three indicators (HAZ, WAZ and WHZ) to the level of the FA and examine relationships among them and individually at FA level.

Since each FA was covered by only one enumerators, this technique would reveal gross systematic errors by individual enumerators, if they exist. The indicators conformed to normal distributions when examined individually, and to bivariate normal distributions when examined together. Thus, no exclusions were made on the basis of these tests.

APPENDIX 3

A TECHNICAL NOTE CONCERNING THE ADJUSTMENT OF PREVALENCE ESTIMATES FOR VARIANCES INFLATED BY MEASUREMENT ERROR

A common problem in comparing prevalence estimates between surveys separated in time is the possibility that one survey may have had higher levels of random measurement errors than the other. This was suspected to be the case when trying to compare the 1983 and 1992 surveys conducted by the CSA, for several reasons. As for example, the 1992 survey was conducted with quite experienced enumerators and supervisors, and it has also been noted that the 1992 field staff had received more training as compared to the 1983. Duration of trainning was 3 days in 1983 while it was 7 days in 1992. Further examination of the data reveals that, 1) estimates of standard deviations are systematically higher (by 25-30%) in the 1983 survey than in the 1992 survey; 2) examination of frequency distributions from the 1983 survey reveals a slight excess in cases at the tails of the distribution as compared to the 1992; and 3) the Standard Deviation (SD) values in the 1983 survey are far in excess of those usually found in other surveys at national or local levels. On the other hand there are reasons to believe that supervision was better in the 1983 survey.

It should be noted that the variance of anthropometric variables can be increased as a result of real variations in nutritional conditions within and between communities, such that the adjustment of prevalence estimates should not be undertaken on a routine basis. However, this was not felt to be a sufficient explanation in the present case (i.e., in the 1983) because the SD values in the survey were found to be inflated for all three indicators (height-for-age, weight-for-height and weight-for-age) and in all regions. If the explanation had to do with environmental factors, one would have expected this to occur in some regions but not in all of them.

The preferred method for adjusting for measurement is to ensure that a random sample of children is re-measured by a second observer shortly after the first measurement has been taken. This would permit a direct estimate of measurement error to be made so that corresponding adjustments can be made at the time of analysis. However, as in many cases, this was not done in 1983 or 1992 in the Ethiopian surveys, thereby precluding the use of this methodology.

An alternative statistical procedure was developed using the raw data from the 1992 survey. The basic principle was to derive a regression equation relating the cross-sectional variation in prevalences of nutritional indicator across sub-populations to the value of the Standard Deviation (SD) in each sub-population, after controlling for variation in the mean Z-score. Thus, for height-for-age indicator (i.e., prevalence of stunting) the equation was:

Prevalence of stunting = Bo + B1 (Mean HAZ) + B2 (SE of HAZ)

where Bo= The point representing the values of prevalence of stunting when the standard error of HAZ is equal to zero, keeping mean HAZ constant (i.e. controlling for mean HAZ)

B1= The amount of change produced in the prevalence of stunting by a unit change in Mean of of HAZ, after controlling for variation in the Standared Deviation of HAZ.

B2= The amount of change produced in HAZ prev. by a unit change in Standared error (SE) of HAZ, after controlling for variation in the mean of HAZ indictor.

HAZ= Height for Age Z- Scores

This equation, and corresponding ones for weight-for-height (WH) and weight-for-age (WA), were fit to the data for the 177 awrajas included in the 1992 survey. Awrajas were chosen as the unit of

aggregation because each awraja contains a sufficiently large sample of children to permit reliable estimation of prevalences, means and SD's for the respective indicators.

The results from this analysis are summarized below:

Dependent Variable	Bo	B1	B2	SEE	R^2
prev. of stunting	+13.5	-24.8	-7.9	4.47	.859
(SE)	(2.93)	(.76)	(1.53)		
prev. of Wasting	-16.7	-13.9	+16.1	2.25	.802
(SE)	(1.14)	(.56)	(.88)		
prev. of underweight	-34.0	-39.5	+5.2	3.61	.926
(SE)	(3.35)	(.87)	(2.42)		

Where SE = Standard Error of estimated B_i's
SEE= Standard Error of estimated prevalence and
R^2= Coefficient of variation

Assuming that it is only the variance which is suspected to differ due to measurement error (and not the mean Z-score), then the above equations are readily simplified as follows:

For stunting prevalences, <u>decrease</u> the observed prevalence by 7.9 percentage points for each 1 unit increase suspected in the SD;

For wasting prevalences, <u>increase</u> the observed prevalence by 16.1 percentage points for each 1 unit increase suspected in the SD;

For underweight prevalences, increase the observed prevalence by 5.2 percentage points for each 1 unit increase suspected in the SD.

Thus, in the present case the SD for HAZ is .58 units higher than the 1992 survey. If all of this is due to random measurement error (and the mean HAZ has not been affected), then the stunting prevalence in 1983 would actually be .58 x 7.9=4.6 percentage points lower than that actually observed (i.e. it would be 55.2 rather than 59.8). Note that this would imply an even greater deterioration in the nutritional status of rural children than that suggested by the unadjusted prevalences (i.e. that the stunting prevalence has increased by 8.8 points rather than 4.2). The figures for individual regions would be affected to varying extents, depending upon the size of the SD difference between the two surveys. Note that the figures provided in this report have not been adjusted, in order to avoid confusion or controversy concerning the appropriateness of such adjustments. In the present case the unadjusted figures convey the same message as would be conveyed by the adjusted figures, and a conservative approach has therefore been adopted.

It should be noted that the above equations are specific to the case where prevalences have been calculated on the basis of a cut-off point of -2 Z-scores for each of the indicators. As noted, they also assume that the SD difference between the two surveys is entirely due to random measurement, rather than true variation in nutritional conditions, and that the mean Z-score has not been biased by measurement error. The latter assumption was found to be highly suspect in the case of WH from the 1983 survey, for instance; the mean WHZ in that survey was -.09 and seemed highly influenced by selected regions (Arsi, Bale, Gamo Gafo and Sidamo) where the changes in mean HAZ over the nine-year period do not reflect the changes in the prevalence of stunting. Thus, applying the SD adjustment factor without simultaneously adjusting for a bias in the mean WHZ would produce an implausibly low estimate of

wasting prevalence (1.5%). For this reason again, it was preferred not to apply the adjustment.

It is worth noting that the adjustment factor for WH provided here is similar in magnitude to that produced independently by RRC, although the data, assumptions, methods and intended uses of this factor differ in important ways. The RRC Guidelines[7] suggest that at a mean WH of 95% of median (roughly the national level in the 1992 survey) a 20% increase in the SD translates into a 2.5 percentage point difference in the prevalence. Thus, a 1 unit increase in the SD would correspond to a 12.5 percentage point difference in prevalence, similar to the figure of 16.1 derived here.

APPENDIX 4

THE EFFECTS OF STATISTICAL WEIGHTS AND VARIABLE NUMBER OF CHILDREN PER HOUSEHOLD ON PREVALENCE ESTIMATES AND REGIONAL SHARES OF THE POPULATION

This section provides documentation of the effects of two sampling-related issues on the results from the national survey. The two issues are: 1) Statistical adjustment for uncovered awrajas in some of the regions; and 2) the fact that multiple children under 60 months occur in many households, and the analysis included all such children in the analysis. The primary concern is whether the regional or national prevalence estimates are affected by either of these issues; a related concern is whether the estimated regional share of the national population is affected. To investigate these questions, the data were classified in to six for each region as shown in this table:

	One Child per Household (oldest)	Given Number of Children per Household
a) Unweighted		
b) Weighted		
c) Additional Adjusted for Uncovered Awrajas		

The results are shown in the appendix tables 20 and 21. The prevalence of stunting is shown in the first table, and the regional population shares are shown in the second table. Note that the unweighted results are provided simply for reference purposes, so the real object of concern is the difference between weighted and adjusted results. It can be seen that, with one child chosen per household, the adjustment for missing awrajas has no

effect on the regional prevalence estimates (as expected) and has virtually no effect on the national prevalence estimate (63.9 vs. 63.4). Similar results are found when given number of children per household are included. When including all children per household, the prevalence changes only 1-2 percentage points in most regions. Note that some true change is expected due to the fact that the "additional" children in each household are always younger than the first child. Thus, it appears that neither of these two issues is of concern for prevalence estimation at national or regional levels.

The second table shows that the use of the adjustment for uncovered awrajas does change the regional share of the total population. Some regions increase their share of total population by 30-100%, while others descrease their share by 10 - 20%. This change is desirable because one would like the data to reflect the actual distribution of the population across the regions , which is precisely what the adjustment procedure accomplishes.

APPENDIX 5

ESTIMATION PROCEDURE

Unbiased estimation procedures to estimate totals of characteristics of interest are given below.

Notations:

Let Y_{hij} = A measure of characteristic Y for the jth, sample household in the ith FA of Awraja h.

h_{hi} = Sample number of households in the i^{th} FA and Awraja h.

H_{hi} = Total listed households eligible for the survey in the i^{th} FA and Awraja h.

$P_{hi} = M_{hi}/M_h$ = Probability of selection of the i^{th} FA in Awraja h.

M_{hi} = Measure of size of the i^{th} Fa in Awraja h.

M_h = Measure of size of Awraja h.

n_h = Sample number of FAs in Awraja h.

P_R = Total population in Region R.

$P_{R'}$ = Total population in covered Awrajas by the survey of Region R.

An estimate of Awraja total, $\hat{Y}_h$, is :

$$\hat{Y}_h = \sum_i \hat{Y}_{hi} \quad ; \text{ where } \hat{Y}_{hi} = (Hhi/(n_h P_{hi} h_{hi})) \sum_j Y_{hij}$$

An estimate for regional total, $\hat{Y}_R$ is:

$$\hat{Y}_R = (P_R/P_{R'}) \sum_h \hat{Y}_h$$

Note: For regions with no Awrajas left uncovered the adjustment rate, $P_R/P_{R'}$, is unity whereas for regions with uncovered Awrajas the rate is greater than one.

An overall total estimate for the sampled national population are obtained by aggregating regional estimates of totals.

Sampling Errors

Sampling errors for the above statistics are estimated by assuming the FAs were selected with replacement. Although there is a slight

over statement of the sampling variance the assumption highly simplifies its estimation.

The formula of the variance estimates are given by:

$$Var(\hat{Y}_h) = (n_h/n_{h-1})(\sum_i \hat{Y}_{hi}^2 - \hat{Y}_h^2/n_h)$$

$$Var(\hat{Y}_R) = (P_R/P_{R'})^2 \sum_k Var(\hat{Y}_h)$$

The variance estimate for total estimate of surveyed national population is obtained by adding variance estimates of the regional estimates.

Coefficient of variation, CV, of estimates can be estimated by the following formula:

$$CV(\hat{Y}_h) = \frac{\sqrt{var(\hat{Y}_h)}}{\hat{Y}_h} \times 100$$

$$CV(\hat{Y}_R) = \frac{\sqrt{var(\hat{Y}_R)}}{\hat{Y}_R} \times 100$$

Certain results from the survey data may take the form of ratios of two random variables Y and X, for example, rate of children being breastfed. In such a case the combined ratio estimate at national level is given by :

$$R = Y/X = \sum_k Y_R / \sum_k X_R$$

Estimate for X characteristic is derived using identical procedure developed for the estimation of the Y characteristic. Approximate Sampling variance of the ratio estimator, $\hat{R}$, is given by:

$$\hat{Var}(\hat{R}) = 1 / \hat{X}^2 \left(\hat{var}(\hat{Y}) + \hat{R}^2 \hat{var}(\hat{X}) - 2\hat{R}\hat{cov}(\hat{Y},\hat{X}) \right)$$

APPENDIX 6

APPENDIX TABLES

App. Table 1a- Prevalence of Low Height for Age (as percent of median classification) by Age and Sex

Age Group	Sex	Height for age: Greater or equal to 90%		Height for age: Less than 90%		Total	
		Number	%	Number	%	Number	%
6 - 11	Male	219,270	61.8	135,648	38.2	354,918	100
	Female	222,823	67.2	108,686	32.8	331,509	100
	B.Sexes	442,093	64.4	244,334	35.6	686,427	100
12 - 23	Male	290,503	46.0	340,709	54.0	631,212	100
	Female	293,302	50.3	289,972	49.7	583,273	100
	B.Sexes	583,805	48.1	630,681	51.9	1,214,485	100
24 - 35	Male	314,917	55.0	258,082	45.0	573,000	100
	Female	294,406	53.9	251,501	46.1	545,907	100
	B.Sexes	609,323	54.5	509,583	45.5	1,118,907	100
36 - 59	Male	602,478	51.3	571,860	48.7	1,174,338	100
	Female	604,198	53.5	525,185	46.5	1,129,383	100
	B.Sexes	1,206,676	52.4	1,097,045	47.6	2,303,721	100
6 - 59	Male	1,427,168	52.2	1,306,299	47.8	2,733,468	100
	Female	1,414,729	54.6	1,175,344	45.4	2,590,072	100
	B.Sexes	2,841,897	53.4	2,481,643	46.6	5,323,540	100

Note: Number in this and forthcoming tables referes to estimated total number of children in the rural areas of the 22 Regions covered

App. Table 1b- Prevalence of Low Weight for Height (as a percent of median classification) by Age and Sex

Age Group	Sex	Weight for Heigh					
		Greater than or equal to 80%		Less than 80%		Total	
		Number	%	Number	%	Number	%
6 - 11	Male	338,979	95.5	15,939	4.5	354,918	100
	Female	315,543	95.2	15,967	4.8	331,509	100
	B.Sexes	654,582	95.4	31,906	4.6	686,427	100
12 - 23	Male	582,448	92.3	48,764	7.7	631,212	100
	Female	543,438	93.2	39,836	6.8	583,273	100
	B.Sexes	1,125,886	92.7	88,600	7.3	1,214,485	100
24 -35	Male	541,935	94.6	31,065	5.4	573,000	100
	Female	512,732	93.9	33,175	6.1	545,907	100
	B.Sexes	1,054,667	94.3	64,240	5.7	1,118,907	100
36 - 59	Male	1,121,601	95.5	52,737	4.5	1,174,338	100
	Female	1,083,951	96.0	45,432	4.0	1,129,383	100
	B.Sexes	2,205,552	95.7	98,169	4.3	2,303,721	100
6 - 59	Male	2,605,744	94.6	148,505	5.4	2,754,249	100
	Female	2,475,921	94.9	134,409	5.1	2,610,330	100
	B.Sexes	5,081,665	94.7	282,914	5.3	5,364,579	100

App.Table 1c- Prevalence of Low Weight for Age (as a percent of Median Classification) by Age and Sex

Age Group	Sex	Weight for Age					
		Greater than or equal to 80%		Less than 80%		Total	
		Number	%	Number	%	Number	%
6 - 11	Male	196,386	55.3	158,533	44.7	345,918	100
	Female	196,594	59.3	134,915	40.7	331,509	100
	B.Sexes	392,980	57.3	293,448	42.7	686,427	100
12 - 23	Male	267,638	42.4	363,574	57.6	631,212	100
	Female	275,453	47.2	307,820	52.8	583,273	100
	B.Sexes	543,091	44.8	671,394	55.2	1,214,485	100
24 - 35	Male	298,527	52.1	274,472	47.9	573,000	100
	Female	281,500	51.6	264,407	48.4	545,907	100
	B.Sexes	580,027	51.9	538,879	48.1	1,118,907	100
36 - 59	Male	538,486	45.9	635,852	54.1	1,174,338	100
	Female	589,206	52.2	540,178	47.8	1,129,383	100
	B.Sexes	1,127,692	49.0	1,176,030	51.0	2,303,721	100
6 - 59	Male	1,321,818	48.0	1,432,431	52.0	2,754,249	100
	Female	1,363,010	52.2	1,247,320	47.8	2,610,303	100
	B.Sexes	2,684,828	50.1	2,679,751	49.9	5,364,579	100

App.Table 2a Centile Distribution of Height for Age of Children aged 6 - 59 Months by Region

Region	Centile													No. of Cases in the sample
	0 to 2	3 to 4	5 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100	Total	
Arsi	64.6	5.9	7.1	8.3	3.1	3.3	1.2	1.1	2.0	0.9	1.0	1.5	100	945
Bale	58.1	7.0	7.8	7.3	5.0	3.7	2.1	2.7	1.1	1.4	2.2	1.7	100	754
N.Omo	62.4	5.5	8.5	7.1	4.9	2.0	2.0	2.0	1.7	0.8	1.0	2.1	100	1,395
S.Omo	51.1	4.0	8.1	8.5	3.9	4.3	4.0	3.1	4.1	2.2	0.7	5.2	100	446
E.Gojam	71.2	4.9	6.9	6.4	3.3	1.3	0.7	1.4	1.0	1.2	0.7	0.9	100	1,069
W.Gojam	76.3	4.0	5.5	4.5	1.9	1.8	1.8	0.9	0.8	0.9	0.1	1.4	100	1,005
Metkel	61.3	5.1	9.9	8.6	3.5	2.7	1.8	2.5	0.6	1.7	1.0	1.2	100	483
N.Gonder	68.4	7.4	7.7	6.8	2.6	1.1	1.1	1.3	0.4	0.6	0.3	2.2	100	1,011
S.Gonder	78.0	4.6	5.2	4.1	2.9	1.4	0.3	1.6	0.1	0.0	0.5	1.2	100	541
Ilubabor	69.6	5.2	7.5	6.7	3.7	1.5	0.9	1.5	0.8	0.6	0.7	1.4	100	1,222
Kefa	62.9	5.1	8.2	5.6	4.2	1.7	2.6	2.9	1.4	2.4	0.6	2.5	100	1,119
N.Shewa	60.1	6.3	7.4	9.5	4.7	2.2	0.7	2.8	1.4	1.8	0.6	2.5	100	453
E.Shewa	61.5	5.0	6.9	9.0	4.6	3.4	2.0	2.5	1.4	1.0	1.1	1.5	100	771
W.Shewa	65.1	6.7	7.9	8.4	2.9	2.1	2.1	1.6	1.0	0.9	0.7	0.5	100	1,125
S.Shewa	68.3	4.9	6.1	5.9	4.1	2.1	1.6	2.2	1.1	0.7	0.5	2.5	100	1,288
A.Abeba	59.1	5.9	8.4	9.0	3.9	2.9	2.4	1.9	2.6	1.4	0.6	2.0	100	997
Sidamo	68.5	3.8	6.4	6.5	3.7	2.4	2.0	0.8	0.9	1.4	0.8	2.7	100	1,375
Borena	59.1	5.2	4.3	7.2	5.1	3.5	2.5	3.0	2.2	1.6	2.7	3.5	100	734
Tigray	70.9	4.5	6.3	6.9	2.8	1.8	1.1	0.8	0.6	1.1	1.0	2.0	100	1,292
Welega	63.3	7.4	9.9	6.1	4.3	2.0	1.6	1.1	0.2	1.8	0.7	1.5	100	857
N.Welo	71.2	4.1	3.6	6.1	3.3	1.4	2.3	1.3	1.2	1.2	1.4	2.9	100	821
S.Welo	65.5	6.3	6.5	6.8	3.3	3.3	1.6	1.7	2.0	1.0	0.7	1.1	100	756
All Region	66.9	5.4	7.0	6.9	3.6	2.2	1.6	1.6	1.1	1.1	0.8	1.8	100	20,459

Table 2b Centile Distribution of Weight for Age of Children Aged 6 - 59 Months by Region

Region	Centile													No. of Cases in the sample
	0 to 2	3 to 4	5 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100	Total	
Arsi	45.0	8.9	14.7	11.4	8.1	4.4	2.4	2.1	1.4	0.5	0.6	0.6	100	945
Bale	33.1	8.9	13.9	17.8	9.4	5.6	4.2	2.6	1.9	1.4	0.8	0.4	100	754
N.Omo	53.0	7.5	11.3	10.6	6.0	2.6	2.9	2.1	1.3	0.7	0.6	1.4	100	1,395
S.Omo	39.1	8.8	13.9	9.9	5.7	4.4	3.7	3.5	2.7	2.7	2.0	3.6	100	446
E.Gojam	60.3	9.0	11.1	8.5	4.4	2.9	1.2	0.7	0.8	0.5	0.3	0.5	100	1,069
W.Gojam	58.6	7.6	12.4	10.0	3.7	2.6	1.9	0.9	0.5	0.2	0.3	1.2	100	1,005
Metkel	46.6	10.7	14.2	12.6	4.8	2.3	2.7	3.1	1.4	0.4	0.6	0.8	100	483
N.Gonder	57.5	9.8	12.8	9.9	3.3	2.1	0.7	1.0	0.4	0.5	0.2	1.8	100	1,011
S.Gonder	67.6	8.3	10.1	7.4	2.5	1.6	1.2	0.8	0.1	0.0	0.0	0.4	100	541
Ilubabor	57.4	7.8	12.4	10.1	5.1	3.1	1.3	0.5	0.9	0.6	0.3	0.5	100	1,222
Kefa	43.4	8.6	12.6	13.1	7.8	4.1	2.6	2.4	2.3	0.8	1.0	1.1	100	1,119
N.Shewa	36.5	10.7	16.6	14.8	7.7	5.0	3.3	2.7	1.2	0.2	0.4	0.9	100	453
E.Shewa	44.3	8.6	11.6	13.8	8.0	4.5	3.5	2.6	1.9	0.7	0.5	0.1	100	771
W.Shewa	44.8	10.3	13.2	13.6	6.0	4.5	2.5	2.4	1.5	0.5	0.5	0.2	100	1,125
S.Shewa	48.9	8.3	12.2	12.6	6.9	3.1	2.0	1.8	1.5	0.7	0.9	0.5	100	1,288
A.Abeba	36.9	9.9	12.3	17.1	9.6	4.6	3.0	2.0	2.3	1.5	0.3	0.5	100	996
Sidamo	58.5	6.8	10.1	8.8	4.5	3.6	2.0	1.9	1.3	0.5	0.5	1.5	100	1,375
Borena	50.4	8.6	11.7	9.8	7.7	3.3	1.9	1.9	1.3	1.1	1.8	0.4	100	734
Tigray	64.6	7.8	10.0	7.6	3.4	2.3	1.4	1.0	0.6	0.6	0.3	0.4	100	1,292
Welega	57.0	9.9	12.3	7.8	4.3	3.3	1.6	1.1	1.8	0.3	0.2	0.3	100	857
N.Welo	55.4	7.2	10.6	10.1	6.7	3.8	2.0	1.4	0.6	0.5	0.2	1.4	100	822
S.Welo	53.0	7.8	11.8	11.6	7.1	3.4	2.3	1,2	0.8	0.3	0.2	0.5	100	754
All Region	52.4	8.6	12.2	10.9	5.7	3.4	2.1	1.6	1.2	0.5	0.5	0.8	100	20,457

Table 2c Centile Distribution of Weight for Age of Children Aged 6 - 59 Months by Region

Region	Centile													No. of Cases in the sample
	0 to 2	3 to 4	5 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 100	Total	
Arsi	6.0	2.6	10.1	13.3	13.2	12.0	11.2	11.1	6.0	5.2	5.4	3.9	100	941
Bale	5.9	2.3	6.5	12.4	11.0	10.6	7.5	10.6	7.6	8.9	6.6	10.1	100	746
N.Omo	9.2	4.8	9.3	15.3	12.1	9.9	8.9	9.7	7.1	5.4	4.1	4.2	100	1,387
S.Omo	7.7	2.0	5.5	16.3	12.6	10.1	11.6	7.8	7.7	5.2	4.7	8.7	100	445
E.Gojam	15.1	3.6	8.5	13.2	11.1	9.8	7.5	6.1	5.8	4.4	4.8	10.0	100	1,060
W.Gojam	10.1	3.3	8.2	14.9	12.1	10.1	7.3	8.4	6.4	5.3	5.8	7.9	100	955
Metkel	8.5	5.6	7.2	16.9	12.8	12.7	7.3	8.5	6.5	3.5	3.9	6.6	100	483
N.Gonder	10.0	4.1	10.0	17.8	11.1	11.3	8.0	9.1	6.9	4.7	3.3	3.6	100	988
S.Gonder	11.7	4.6	11.6	17.2	13.8	12.1	5.1	6.9	6.1	4.7	3.7	2.5	100	538
Ilubabor	11.6	5.4	8.2	16.5	11.3	7.8	7.3	8.5	6.0	3.4	5.8	8.2	100	1,213
Kefa	8.4	4.4	7.7	11.1	11.0	8.1	7.5	10.1	8.3	7.6	5.2	10.2	100	1,104
N.Shewa	6.4	3.1	8.5	11.6	15.0	8.4	8.0	10.3	9.2	6.3	5.5	7.7	100	452
E.Shewa	7.6	4.1	7.5	12.8	12.5	10.7	9.4	10.0	6.4	6.4	5.4	7.2	100	770
W.Shewa	6.4	2.5	8.3	13.7	13.1	10.1	8.9	8.3	6.7	5.1	5.1	8.8	100	1,125
S.Shewa	9.1	2.3	8.0	13.4	10.8	10.4	7.7	8.7	7.2	6.6	6.0	9.8	100	1,278
A.Abeba	6.8	2.7	7.9	12.7	13.0	11.9	8.3	7.5	9.7	7.7	4.2	8.2	100	992
Sidamo	13.0	4.8	10.2	14.1	10.3	9.7	7.4	7.1	7.6	5.2	4.3	6.3	100	1,352
Borena	15.3	5.5	10.1	15.4	9.8	7.2	7.9	6.5	5.3	5.9	3.0	8.2	100	734
Tigray	17.5	4.8	12.0	15.9	11.2	8.9	6.8	7.0	3.8	4.0	2.8	5.1	100	1,288
Welega	12.4	7.4	11.5	16.8	13.3	11.4	6.2	6.0	5.8	3.3	2.9	3.0	100	857
N.Welo	10.0	6.1	7.9	16.2	9.8	9.8	8.0	10.6	6.9	5.2	4.5	5.0	100	811
S.Welo	7.1	3.5	10.2	17.4	11.8	12.2	8.3	9.4	6.0	4.2	3.7	6.0	100	749
All Region	10.1	4.1	9.1	14.9	11.8	10.1	8.0	8.3	6.8	5.4	4.6	6.7	100	20,308

App.Table 3a Prevalence of Low Height for Age by Age, Sex and Severity
(Z- Scores)

Nutritional Status	Sex	Entry Desig.	Age Group 6-11	12-23	24-35	36-59	6-59
Normal	Male	No	55266	64171	76792	182636	378865
		%	17.2	10.9	14.3	16.1	14.7
	Female	No	59110	66735	83848	199188	408881
		%	19.8	12.3	16.4	18.3	16.8
	Total	No	114376	130906	160640	381824	787746
		%	18.5	11.6	15.3	17.2	15.7
Mild malnutrition	Male	No	76336	86058	108306	235710	506410
		%	23.8	14.6	20.2	20.8	19.6
	Female	No	78935	91130	104625	224608	499297
		%	26.4	16.8	20.5	20.7	20.5
	Total	No	155271	177188	212931	460318	1005707
		%	25.1	15.7	20.3	20.7	20.1
Moderate malnutrition	Male	No	83812	158761	147230	333343	723146
		%	26.1	27.0	27.4	29.4	28.0
	Female	No	82548	150626	135008	292748	660930
		%	27.7	27.8	26.4	20.7	27.1
	Total	No	166360	309387	282238	626091	1384076
		%	26.8	27.4	26.9	28.2	27.6
Severe malnutrition	Male	No	105799	279136	204424	381272	970631
		%	32.9	47.5	38.1	33.7	37.6
	Female	No	77923	233010	187421	369199	867553
		%	26.1	43.0	36.7	34.0	35.6
	Total	No	183722	512146	391845	750471	1838184
		%	29.6	45.3	37.4	33.8	36.6
Total	Male	No	319101	587254	533482	112218	2572956
		%	100.0	100.0	100.0	100.0	100.0
	Female	No	293437	540943	506020	1086168	2426,568
		%	100.0	100.0	100.0	100.0	100.0
	Total	No	612538	1128197	1039502	2219286	4999524
		%	100.0	100.0	100.0	100.0	100.0

App.Table 3b Prevalence of Low Weight for Height by Age, Sex and Severity
(Z- Scores)

Nutritional Status	Sex	Entry desig.	Age Group 6-11	12-23	24-35	36-59	6-59
Normale	Male	No	244242	365323	364972	743336	1717874
		%	76.5	62.2	68.4	65.6	66.8
	Female	No	231763	365931	344093	742472	1684259
		%	79.0	67.6	68.0	68.4	69.4
	Total	No	476005	731254	709065	1485808	3402133
		%	77.7	64.8	68.2	66.9	68.0
Mild malnutrition	Male	No	54199	145382	131539	300210	631331
		%	17.0	24.8	24.7	26.5	24.5
	Female	No	43895	119830	126704	276880	567309
		%	15.0	22.2	25.0	25.5	23.4
	Total	No	98094	265212	258243	577090	1198640
		%	16.0	23.5	24.8	26.0	24.0
Moderate malnutrition	Male	No	16639	60526	26561	78899	182625
		%	5.2	10.3	5.0	7.0	7.1
	Female	No	13690	44652	28263	56270	142875
		%	4.7	8.3	5.6	5.2	5.9
	Total	No	30329	105178	54824	135169	325500
		%	5.0	9.3	5.3	6.1	6.5
Severe malnutrition	Male	No	4020	16023	10410	10673	41126
		%	1.3	2.7	2.0	0.9	1.6
	Female	No	4090	10531	6960	10545	32125
		%	1.4	1.9	1.4	1.0	1.3
	Total	No	8110	26554	17370	21218	73251
		%	1.3	2.4	1.7	1.0	1.5
Total	Male	No	319101	587254	533482	1133118	2572956
		%	100.0	100.0	100.0	100.0	100.0
	Female	No	293437	540943	506020	1086168	2426568
		%	100.0	100.0	100.0	100.0	100.0
	Total	No	612538	1128197	1039502	2219286	4999524
		%	100.0	100.0	100.0	100.0	100.0

App.Table 3c Prevalence of Low Weight for Age by Age, Sex and Sevenity
(Z- Scores)

Nutritional Status	Sex	Entry desig.	Age Group 6-11	12-23	24-35	36-59	6-59
Normal	Male	No	82956	81614	98300	199312	462182
		%	25.7	13.8	18.3	17.5	17.9
	Female	No	88651	96122	100095	217268	502135
		%	29.6	17.6	19.5	19.9	20.5
	Total	No	171607	177736	198395	416580	964317
		%	22.6	15.6	18.9	18.7	19.2
Mild malnutrition	Male	No	102520	156894	167791	423654	850859
		%	31.8	26.5	31.2	37.2	32.9
	Female	No	102536	176201	154259	387606	820597
		%	34.2	32.3	30.1	35.6	33.5
	Total	No	205056	333095	322045	811260	1671456
		%	33.0	29.3	30.7	36.4	33.2
Moderate malnutrition	Male	No	85295	215734	166159	386059	853248
		%	26.4	36.5	30.9	33.9	33.0
	Female	No	71658	174854	162465	332722	741699
		%	23.9	32.1	31.7	30.5	30.3
	Total	No	156953	390588	328624	718781	1594947
		%	25.2	34.4	31.3	32.3	31.7
Severe malnutrition	Male	No	51916	137313	104743	128879	422851
		%	16.1	23.2	19.5	11.3	16.3
	Female	No	36596	97652	95697	151739	381684
		%	12.2	17.9	18.7	13.9	15.6
	Total	No	88512	234965	200440	280618	804535
		%	14.2	20.7	19.1	12.6	16.0
Total	Male	No	322688	591555	536994	1137903	2589140
		%	100.0	100.0	100.0	100.0	100.0
	Female	No	299440	544829	512511	1089335	2446116
		%	100.0	100.0	100.0	100.0	100.0
	Total	No	622128	1136384	1049505	2227238	5035256
		%	100.0	100.0	100.0	100.0	100.0

App.Table 4a- Prevalence of Low Height for Age (by percent of Median classification) by Region

Region	Height for Age: Greater than or equal to 90%		Height for Age: Less than 90 %		Total	
	Number	%	Number	%	Number	%
Arsi	215,745	60.7	139,921	39.3	355,666	100
Bale	69,699	63.3	40,450	36.7	110,148	100
North Omo	221,412	55.9	175,013	44.1	396,425	100
South Omo	17,823	64.6	9,768	35.4	27,591	100
East Gojam	113,841	48.4	121,344	51.6	235,185	100
West Gojam	137,212	45.9	161,403	54.1	298,615	100
Metekel	19,559	59.4	13,367	40.6	32,926	100
North Gonder	104,451	51.7	97,508	48.3	201,959	100
South Gonder	106,216	45.5	127,203	54.5	233,419	100
Ilubabor	167,769	51.1	160,481	48.9	328,250	100
Kefa	79,800	55.4	64,193	44.6	143,993	100
North Shewa	203,554	67.2	99,398	32.8	302,952	100
East Shewa	62,335	60.4	40,846	39.6	103,181	100
West Shewa	242,451	54.0	206,185	46.0	448,630	100
South Shewa	224,616	46.7	259,976	53.6	484,592	100
Addis Ababa	41,474	63.6	23,718	36.4	65,192	100
Sidamo	213,733	48.9	223,672	51.1	437,405	100
Borena	77,675	60.7	50,285	39.3	127,960	100
Tigray	153,709	47.3	170,929	52.7	324,638	100
Welega	151,637	59.8	102,027	40.2	253,664	100
North Welo	56,750	49.2	58,488	50.8	115,238	100
South Welo	164,771	54.9	135,468	45.1	300,239	100
All Regions	2,846,231	53.4	2,481,643	46.6	5,327,874	100

App.Table 4b- Prevalence of Low Weight for Height (as percent of Median classification) by Region

Region	Weight for Height					
	Greater than or equal to 80%		Less than 80%		Total	
	Number	%	Number	%	Number	%
Arsi	345,301	97.1	10,365	2.9	355,666	100
Bali	107,896	98.0	2,252	2.0	110,148	100
North Omo	382,282	96.4	14,143	3.6	396,425	100
South Omo	26,506	96.1	1,085	3.2	27,591	100
East Gojam	211,638	90.0	23,547	10.0	235,185	100
West Gojam	280,656	94.0	17,959	6.0	298,615	100
Metekel	31,432	95.5	1,494	4.5	32,926	100
North Gonder	190,673	94.4	11,286	5.6	201,959	100
South Gonder	217,787	93.3	15,632	6.7	233,419	100
Ilubabor	308,874	94.1	19,376	5.9	328,250	100
Kefa	136,655	94.9	7,338	5.1	143,993	100
North Shewa	292,636	96.6	10,316	3.4	302,952	100
East Shewa	98,265	95.2	4,916	4.8	103,181	100
West Shewa	433,786	96.7	14,850	3.3	448,636	100
South Shewa	462,969	95.5	21,623	4.5	484,592	100
Addis Ababa	62,577	96.0	2,615	4.0	65,192	100
Sidamo	407,769	93.2	29,636	6.8	437,405	100
Borena	116,856	91.3	11,104	8.7	127,960	100
Tigray	294,869	90.8	29,769	9.2	324,638	100
Welega	235,720	92.9	17,944	7.1	253,664	100
North Welo	108,234	93.9	7,007	6.1	115,238	100
South Welo	291,582	97.1	8,657	2.9	300,239	100
All Region	5,044,960	94.7	282,914	5.3	5,328,874	100

App.Table 4c- Prevalence of Low Weight for Age (as percent of Median calssification) by Region

Region	Weight for Age: Greater than or equal to 80%		Weight for Age: Less than 80 %		Total	
	Number	%	Number	%	Number	%
Arsi	202,609	57.0	153,057	43.0	355,666	100
Bale	74,369	67.5	35,779	32.5	110,148	100
North Omo	197,808	49.9	198,617	50.1	396,425	100
South Omo	17,472	63.3	10,119	36.7	27,591	100
East Gojam	100,250	42.6	134,935	57.4	235,185	100
West Gojam	130,922	43.8	167,693	56.2	298,615	100
Metekel	18,351	55.7	14,575	44.3	32,926	100
North Gonder	90,127	44.6	111,832	55.4	201,959	100
South Gonder	81,919	35.1	151,500	64.9	233,419	100
Ilubabor	152,044	46.3	176,206	53.7	328,250	100
Kefa	83,300	57.8	60,693	42.2	143,993	100
North Shewa	202,687	66.9	100,265	33.1	302,952	100
East Shewa	58,750	56.9	44,431	43.1	103,181	100
West Shewa	249,131	55.5	199,505	44.5	448,636	100
South Shewa	253,317	52.3	231,275	47.7	484,592	100
Addis Ababa	41,509	63.7	23,683	36.3	65,192	100
Sidamo	182,258	41.7	255,147	58.3	437,405	100
Borena	67,057	52.4	60,903	47.6	127,960	100
Tigray	120,776	37.2	203,862	62.8	324,638	100
Welega	115,140	45.4	138,524	54.6	253,664	100
North Welo	54,721	47.5	60,517	52.5	115,238	100
South Welo	153,606	51.2	146,633	48.8	300,239	100
All Regions	2,648,123	49.7	2,679,751	50.3	5,327,874	100

App.Table 5- Prevalnce of General Malnurition (Under Weigth) by Region (based on z-scores)

Region	Nutrition Status					
	Under Weight		Normal		Total	
	Number	%	Number	%	Number	%
Arsi	138,301	41.1	198,331	58.9	336,632	100
Bale	30,628	29.2	74,293	70.8	104,921	100
North Omo	180,911	48.5	192,103	51.5	373,014	100
South Omo	9,201	35.9	16,460	64.1	25,661	100
East Gojam	118,587	54.1	100,726	45.9	219,313	100
West Gojam	151,946	53.8	130,724	46.2	282,670	100
Metekel	13,345	42.6	17,966	57.4	31,311	100
North Gonder	100,125	52.9	89,060	47.1	189,185	100
South Gonder	137,064	62.0	84,163	38.0	221,227	100
Ilubabor	160,855	52.5	145,577	47.5	306,432	100
Kefa	51,148	38.2	82,862	61.8	134,010	100
North Shewa	88,763	31.1	196,741	68.9	285,504	100
East Shewa	39,413	40.2	58,677	59.8	98,090	100
West Shewa	172,256	39.8	260,557	60.2	432,813	100
South Shewa	207,413	44.4	259,448	55.6	466,861	100
Addis Ababa	20,519	33.3	41,032	66.7	61,551	100
Sidamo	231,342	55.0	188,939	45.0	420,281	100
Borena	53,835	45.4	64,693	54.6	118,528	100
Tigray	184,802	59.9	123,972	40.1	308,774	100
Welega	122,858	51.6	115,259	48.4	238,117	100
North Welo	56,392	53.0	49,916	47.0	106,308	100
South Welo	129,776	47.3	144,851	52.7	274,627	100
All Regions	2,399,480	47.7	2,636,350	52.3	5,035,830	100

App.Table 6- Absolute Number of Children Stunted and Wasted by Region and Percentage Distribution Across Region

Region	Stunted			Wasted		
	Number	%	Percentage Share	Number	%	Percentage Share
Arsi	211,400	62.7	6.6	15,529	4.6	3.9
Bale	56,981	55.0	1.8	4,600	4.4	1.2
North Omo	226,800	60.7	7.0	25,729	6.9	6.5
South Omo	12,779	49.2	0.4	1,710	6.6	0.4
East Gojam	150,216	68.9	4.7	28,693	13.3	7.2
West Gojam	207,389	73.6	6.4	22,673	8.1	5.7
Metekel	17,911	57.2	0.6	2,088	6.7	0.5
North Gonder	125,232	66.4	3.9	14,550	7.7	3.6
South Gonder	164,167	74.5	5.1	21,604	9.9	5.4
Ilubabor	203,957	67.1	6.3	27,560	9.1	6.9
Kefa	81,388	60.9	2.5	9,721	7.3	2.4
North Shewa	161,777	56.7	5.0	14,577	5.1	3.7
East Shewa	56,315	57.6	1.7	5,542	5.7	1.4
West Shewa	267,823	62.1	8.2	22,764	5.3	5.7
South Shewa	306,007	66.1	9.5	29,030	6.3	7.3
Addis Ababa	34,119	55.5	1.1	3,122	5.1	0.8
Sidamo	280,529	67.2	8.7	42,275	10.2	10.6
Borena	66,023	55.9	2.0	14,895	12.8	3.7
Tigray	207,907	67.9	6.5	43,143	42.2	10.8
Welega	140,782	59.2	4.4	25,582	10.8	6.4
North Welo	72,577	68.6	2.3	9,217	8.7	2.3
South Welo	170,491	62.3	5.3	14,147	5.2	3.5
All Regions	3,222,571	64.2	100.0	398,751	8.0	100.0

App.Table 7. Absolute Number of Children Stunted and Wasted by Primary Source of Household Income and Percentage Distribution Across source of Income

Primary Source of Household income	Stunted			Wasted		
	Number	%	Percentage share	Number	%	Percentage share
Cereal	1,973,321	64.6	61.3	246,948	8.1	62.0
Roots	86,545	62.8	2.7	13,596	8.9	3.4
Cattle	19,730	52.0	.6	3,157	8.4	.8
Chat	9,285	47.2	.3	2,050	10.4	.5
Coffee	74,281	71.1	2.3	10,994	10.6	2.8
Other Cash Crop	4,222	65.8	.1	622	9.5	.2
Daily Labour	35,600	63.5	1.1	5,114	9.1	1.3
Fuel Sales	11,475	63.6	.4	1,197	6.6	.3
Crafts	33,425	66.3	1.0	3,114	6.1	.8
Traders	55,222	63.4	1.7	7,795	9.0	2.0
Civil Service	14,599	45.9	.5	1,757	5.5	.4
Cereal+Root	240,156	66.2	7.5	23,629	6.5	5.9
Cereal+Cattle	477,023	63.8	14.8	53,294	7.1	13.4
Root+Cattle	51,394	60.4	1.6	7,927	9.3	2.0
Others	134,292	62.9	4.2	17,327	8.2	4.3
Total	3,220,570	64.2	100.0	398,511	8.0	100.0

App.Table 8. Absolute Number of Children Stunted and Wasted by Economic Group and Percentage Distribution Across Economic Group

Economic Group	Stunted			Wasted		
	Number	%	Percentage share	Number	%	Percentage share
Cereal <0.50	323,544	67.5	11.1	54,122	11.4	15.08
Cereal 0.5 to 1.0	540,183	65.0	18.5	69,975	8.5	19.50
Cereal 1.01 to 1.5	474,530	67.5	16.2	53,292	9.6	14.85
Cereal > 1.5	631,902	61.0	21.6	69,311	6.7	19.32
Root < 0.25	21,670	60.4	.7	5,465	15.2	1.52
Root 0.25 to 0.75	40,934	66.8	1.4	5,447	9.0	1.52
Root > 0.75	23,365	58.2	.8	2,683	6.7	.75
Cattle + Cereal	12,742	59.2	.4	1,316	6.1	.37
Cereal+Root < 0.25	55,043	72.3	1.9	4,749	6.3	1.32
Cereal+Root 0.25 to 0.75	83,251	69.6	2.9	7,176	6.0	2.00
Cereal+Root >0.75	100,541	61.0	3.4	11,356	6.9	3.16
Cereal+Cattle < 0.5	81,818	62.4	2.8	9,813	7.5	2.73
Cereal+Cattle 0.5 to 1.0	127,969	65.7	4.4	16,483	8.4	4.59
Cereal+Cattle 1.01 to 1.5	107,440	67.0	3.7	14,871	9.3	4.14
Cereal+Cattle > 1.5	159,558	61.1	5.5	12,109	4.7	3.37
Root+Cattle <0.25	24,290	58.6	.8	4,883	11.8	1.36
Root+Cattle 0.25 to 0.75	18,806	60.5	.6	2,036	6.5	.57
Root+Cattle >0.75	8,565	66.9	.2	1,008	8.0	.28
Coffee < 0.25	11,791	60.6	.4	1,645	8.6	.46
Coffee 0.25 to 0.75	23,115	76.7	.8	1,829	6.1	0.51
Coffee > 0.75	35,748	71.2	1.2	6,585	13.2	1.84
Chat	9,285	47.2	.3	2,049	10.4	.57
Other Cash crop	4,222	65.8	.1	612	9.5	.17
Total	2,920,312	64.2	100.0	358,815	8.0	100.00

App. Table 9. Actual Sample Sizes for Economic Group

Primary Source of household income	Cultivated area class (1)	(2)	(3)	(4)	None Cultivating
Cereals	2,010	3,253	2,590	4,423	-
Roots	106	217	204	-	-
Cattle	-	-	131*	-	104
Chat	-	-	62*	-	-
Coffee	102	146	245	-	-
Other Cash Crop	-	-	39*	-	-
Daily Labor	-	-	-	-	249
Fuel Sales	-	-	-	-	103
Crafts	-	-	-	-	224
Trade	-	-	-	-	372
Civil Service	-	-	-	-	169
Other non-cultivation	-	-	-	-	114
Cereal + roots	199	398	803	-	-
Cereal + cattle	471	796	580	985	-
Root + Cattle	112	89	47	-	-
Other crops	155	293	327	-	-

* all class comblined

App. Table 10 Actual Sample Size for the Analyses of Childe Care

Mothers Ethinic Group	Age Group in Months 6 - 23				24 - 59			
	Boys		Girls		Boys		Girls	
	Not Stunted	Stunted	Not Stunted	Stunted	Not Stuned	Stunted	Not stunted	Stunted
Amhara	307	806	319	685	668	1,230	650	1,181
Gurage	47	62	59	82	87	169	99	118
Tigraway	75	189	54	160	167	318	184	328
Agew	9	29	12	18	34	61	31	59
Kimant	9	21	6	25	26	51	13	44
Oromo	387	693	424	625	829	1,168	804	1,058
Borena	14	18	8	13	38	29	48	22
Guji	7	37	26	29	46	71	45	66
Konso	16	27	13	10	24	32	26	26
Sidamo	48	80	36	71	76	201	62	176
Gedeo	28	54	22	52	54	120	63	108
Hadya	19	58	30	46	53	144	51	129
Kembata	12	36	10	34	30	76	39	81
Ari/Ara	29	43	32	35	76	78	62	72
Gimira/She/ Bencho	25	26	28	34	44	59	55	58
Kefa	13	39	20	33	38	80	34	42
Gamo	31	47	39	48	65	93	72	98
Welaita	23	29	24	36	33	76	32	60
Other	70	132	70	103	154	209	151	193
Mother Religion								
Christian	786	1,710	839	1,535	1,666	3,002	1,677	2,829
Moslem	235	489	240	407	555	819	494	725
Other	147	218	151	196	321	441	345	357
Total	1,168	2,427	1,240	2,137	2,542	4,262	2,516	3,911

App.Table 11- Actual Sample Size for Analysis of Cereal Growers by region and Cultivated Area

Region	Cultivated Area (in Hectar)			
	< .5	.51 - 100	1.01- 1.50	> 1.5
Arsi	33	109	120	179
Bale	9	42	57	212
North Omo	75	126	78	119
South Omo	21	50	26	28
East Gojam	14	58	99	338
West Gojam	44	111	79	123
Metekel	170	25	17	103
North Gonder	27	84	110	337
South Gonder	18	61	101	140
Ilubabor	95	203	112	87
Kefa	61	53	47	55
North Shewa	7	24	63	118
East Shewa	22	88	93	231
West Shewa	30	56	77	162
South Shewa	69	119	77	64
Addis Ababa	17	56	88	280
Sidamo	71	42	14	17
Borena	21	49	34	50
Tigray	275	329	151	75
Welega	57	103	118	156
North Welo	119	176	48	19
South Welo	49	87	79	20
All Regions	1,304	2,051	1,688	2,913

App.Table 12- Distribution of Raised Number of Children by Age (in months) and Sex in the 22 Regions Covered by the Survey

Age (in months)	Sex: Male Number	Male %	Female Number	Female %	Both Sexes Number	Both Sexes %
0	20,786	50.0	20,830	50.1	41,616	100
1	26,323	46.8	29,920	53.2	56,243	100
2	35,917	51.6	33,694	48.4	69,611	100
3	32,219	51.8	29,981	48.2	62,200	100
4	32,248	49.9	33,708	51.1	65,956	100
5	38,910	48.5	41,326	51.5	80,236	100
6	36,850	49.8	37,120	50.2	73,970	100
7	61,067	56.0	48,001	44.0	109,068	100
8	60,745	55.5	48,669	44.5	109,414	100
9	51,008	50.7	49,541	49.3	100,549	100
10	55,594	52.7	49,856	47.3	105,450	100
11	53,371	46.7	60,892	53.3	114,263	100
0 - 5	186,403	49.6	189,459	50.4	375,862	100
6 - 11	318,635	52.0	294,079	48.0	612,714	100
12 - 23	577,324	51.8	536,170	48.2	1,113,494	100
24 - 35	526,766	51.3	499,856	48.7	1,026,622	100
36 - 59	1,113,146	51.2	1,062,011	48.8	2,175,157	100
6 - 59	2,722,274	51.3	2,581,575	48.7	5,303,849	100

App.Table 13- Total Number of Children (raised) by Sex, Broad Age Group(in Months) and Region

Region	Sex	Age Group (in months)		
		6 - 23	24 - 59	6 - 59
Arsi	Male	59,759	119,161	178,920
	Female	62,997	96,805	159,902
	B.Sexes	122,756	215,966	338,722
Bale	Male	18,684	36,525	55,209
	Female	17,194	32,847	50,041
	B.Sexes	35,878	69,372	105,250
North Omo	Male	71,091	122,039	193.130
	Female	67,811	115,105	82,916
	B.Sexes	138,902	237,144	376,046
South Omo	Male	4,616	9,575	14,191
	Female	4,336	7,543	11,879
	B.Sexes	8,952	17,118	26,070
East Gojam	Male	38,708	76,809	115,517
	Female	41,286	63,870	105,156
	B.Sexes	79,994	140,679	220,673
West Gojam	Male	54,668	96,882	151,550
	Female	49,802	84,322	134,124
	B.Sexes	104,470	181,204	285,674
Metekel	Male	4,678	10,550	15,228
	Female	5,255	10,846	16,101
	B.Sexes	9,933	21,396	31,329
North Gonder	Male	36,224	61,222	97,446
	Female	31,600	61,129	92,729
	B.Sexes	67,824	122,351	190,175
South Gonder	Male	48,280	64,571	112,851
	Female	35,159	73,218	108,377
	B.Sexes	83,439	137,789	221,228
Ilubabor	Male	60,484	99,951	160,435
	Female	53,942	94,110	148,052
	B.Sexes	114,426	194,061	308,487
Kefa	Male	26,358	47,311	73,669
	Female	23,653	37,991	61,644
	B.Sexes	50,011	85,302	135,313

App.Table 13- (Contd.)

Region	Sex	Age Group (in months)		
		6-23	24-59	6-59
North Shewa	Male	63,405	89,224	152,629
	Female	49,828	85,700	135,528
	B.Sexes	113,233	174,924	288,157
East Shewa	Male	16,159	32,085	48,244
	Female	20,207	29,903	50,110
	B.Sexes	36,366	61,988	98,354
West Shewa	Male	79,395	136,133	215,528
	Female	79,215	138,940	218,155
	B.Sexes	158,610	275,073	433,683
South Shewa	Male	74,419	158,544	232,963
	Female	71,560	163,420	234,980
	B.Sexes	145,979	321,964	467,943
Addis Ababa	Male	10,042	22,031	32,073
	Female	10,817	19,139	29,956
	B.Sexes	20,859	41,170	62,029
Sidamo	Male	68,160	152,645	220,805
	Female	64,290	137,533	201,823
	B.Sexes	132,450	290,178	422,628
Borena	Male	18,720	43,300	62,020
	Female	15,461	41,363	56,824
	B.Sexes	34,181	84,663	118,844
Tigray	Male	52,699	104,946	157,645
	Female	43,449	109,347	152,796
	B.Sexes	96,148	214,293	310,441
Welega	Male	38,373	77,662	116,035
	Female	43,591	79,289	122,880
	B.Sexes	81,964	156,951	238,915
North Welo	Male	19,287	33,070	52,357
	Female	18,137	36,324	54,461
	B.Sexes	37,424	69,394	106,818
South Welo	Male	59,686	86,637	146,323
	Female	40,696	89,851	130,547
	B.Sexes	100,382	176,488	276,870
All Regions	Male	923,898	1,680,874	2,604,772
	Female	850,288	1,608,595	2,458,883
	B.Sexes	1,774,186	3,289,469	5,063,655

App.Table 14- Total Number of Children (raised) by Sex, Broad Age Groups (in Months) and Main Source of Household Income

Source of Household Income	Sex	Age Group (in Months)		
		6 - 23	24 - 59	6 - 19
Cereal	Male	581,092	994,007	1,575,009
	Female	530,244	980,754	1,510,998
	B.Sexes	1,111,336	1,974,761	3,086,097
Roots	Male	25,178	48,042	73,220
	Female	21,438	44,068	65,506
	B.Sexes	46,616	92,110	138,726
Cattle	Male	7,281	13,707	20,988
	Female	4,170	12,960	17,130
	B.Sexes	11,451	26,667	38,118
Chat	Male	3,160	6,360	9,520
	Female	3,880	6,274	10,154
	B.Sexes	7,040	12,634	19,674
Coffee	Male	17,282	38,024	55,306
	Female	16,991	33,636	50,627
	B.Sexes	34,273	71,660	105,933
Other Cash Crop	Male	1,496	1,630	3,126
	Female	893	2,400	3,293
	B.Sexes	2,389	4,030	6,419
Daily Labor	Male	11,346	17,806	29,152
	Female	7,806	19,324	27,130
	B.sexes	19,152	37,130	56,282
Fuel Sales	Male	3,686	6,895	10,581
	Female	2,599	4,994	7,593
	B.Sexes	6,285	11,889	18,174
Crafts	Male	9,315	12,748	22,063
	Female	13,836	15,182	29,019
	B.Sexes	23,151	27,930	51,082
Traders	Male	14,433	31,047	45,480
	Female	15,607	26,807	42,414
	B.Sexes	30,040	57,854	87,894

App.Table 14- (Contd.)

Source of Household Income	Sex	Age Group (in Months)		
		6 - 23	24 - 59	6 - 19
Civil Service	Male	6,135	10,523	16,658
	Female	6,572	8,601	15,173
	B.Sexes	12,707	19,124	31,831
Cereal + Root	Male	62,832	127,042	189,874
	Female	56,328	119,508	175,836
	B.Sexes	119,161	246,550	365,710
Cereal + Cattle	Male	131,173	265,809	396,982
	Female	117,452	239,049	356,501
	B.Sexes	248,625	504,858	753,483
Root + Cattle	Male	11,106	34,129	45,235
	Female	15,410	24,756	40,166
	B.Sexes	26,516	58,885	85,401
Other	Male	38,014	72,182	110,196
	Female	36,757	69,179	105,936
	B.Sexes	74,771	141,361	216,132
Total	Male	923,530	1,679,951	2,603,481
	Female	849,982	1,607,491	2,457,473
	B.Sexes	1,773,512	3,287,442	5,060,954

App.Table 15 Total Number of Children (raised) by Sex, Broad Age-Group (in months) and Economic Group.

Economic Group	Sex	Age Group		
		6-23	24-59	6-59
Cereal < .5	Male	86,544	147,233	233,777
	Female	89,355	162,402	251,757
	B.Sexes	175,899	309,635	485,534
Cereal .5 to 1.0	Male	165,362	255,433	420,795
	Female	144,252	273,493	417,745
	B.Sexes	309,614	528,926	838,540
Cereal 1.01 to 1.5	Male	143,262	234,926	378,188
	Female	117,561	215,544	333,105
	B.Sexes	260,821	450,470	711,293
Cereal > 1.5	Male	185,024	353,671	538,695
	Female	178,655	327,234	505,889
	B.Sexes	363,679	680,905	1,044,524
Root	Male	6,933	11,339	18,272
< .25	Female	6,136	11,453	17,589
	B.Sexes	13,069	22,798	35,861
Root	Male	12,385	23,344	35,729
26 to 75	Female	8,063	18,085	26,148
	B.Sexes	20,448	41,429	61,877
Root	Male	5,860	12,946	18,806
> 75	Female	7,239	14,365	21,604
	B.Sexes	13,099	27,311	40,410
Cattle + Cereal	Male	4,702	7,341	12,043
	Femlae	3,514	6,083	9,597
	B.Sexes	8,216	13,424	21,640
Cattle	Male	2,579	6,366	8,945
	Female	655	6,877	7,532
	B.Sexes	3,234	13,243	16,477
Cereal + Root	Male	11,251	27,016	38,267
< 25	Female	11,863	25,962	37,825
	B.Sexes	23,114	52,978	76,092
Cereal + Root	Male	19,130	43,222	62,352
25 to 75	Female	21,187	37,682	58,869
	B.Sexes	40,317	80,904	121,221

App.Table 15 (contd.)

Economic group	Sex	Age Group 6 - 23	24 - 59	6 - 59
Cereal + root	Male	31,823	56,161	87,984
> .75	Female	22,957	55,229	78,186
	B.Sexes	54,780	111,390	166,470
Cereal + Cattle	Male	22,135	44,767	66,902
< .5	Femlae	19,909	45,471	65,380
	B.Sexes	42,044	90,238	132,282
Cereal + Cattle	Male	34,012	67,650	101,622
5 to 1.0	Femlae	34,518	61,249	95,767
	B.Sexes	68,570	128,899	197,429
Cereal + rattle	Male	29,137	53,937	83,074
1. to 1.5	Female	24,337	53,382	77,719
	B.Sexes	53,474	107,319	160,793
Cereal + cattle	Male	45,795	99,248	145,043
> 1.5	Female	38,688	78,929	117,617
	B.Sexes	84,483	178,177	262,660
Root + Cattle	Male	5,099	16,477	21,575
< .25	Female	8,239	11,614	19,853
	B.Sexes	13,338	28,091	41,429
Root + Cattle	Male	3,863	13,199	17,062
25 to .75	Female	5,454	8,926	14,370
	B.Sexes	9,317	22,125	31,442
Root + Cattle	Male	2,144	4,453	6,597
> .75	Female	1,717	4,217	5,934
	B.Sexes	3,861	8,670	12,531
Coffee < .25	Male	3,171	7,212	10,383
	Female	3,770	5,410	9,180
	B.Sexes	6,941	12,622	19,563
Coffee	Male	4,997	11,544	16,541
.26 to .75	Female	5,576	8,694	14,270
	B.Sexes	10,573	20,238	30,811
Coffee	Male	8,453	17,787	26,240
> .75	Female	7,375	16,936	24,314
	B.Sexes	15,828	34,723	50,551
Chat	Male	3,160	6,360	9,520
	Female	3,880	6,360	9,520
	B.Sexes	7,040	12,634	19,674

App.Table 15 (Contd.)

Economic Group	Sex	Age Group		
		6 - 23	24 - 59	6 - 59
Other Cash Crops	Male	1,496	1,630	3,126
	Female	893	2,400	3,293
	B.Sexes	2,389	4,030	6,419
Other Combination < .25	Male	9,659	14,924	24,588
	Female	5,671	13,209	18,880
	B.Sexes	15,330	28,133	43,463
Other Combination .25 to .75	Male	13,717	27,836	41,553
	Female	14,100	22,618	36,718
	B.Sexes	27,817	50,454	78,271
Other Combination > .75	Male	11,897	23,428	35,325
	Female	12,301	25,580	37,881
	B.Sexes	24,198	49,008	73,206
Daily Labor	Male	11,346	17,806	29,152
	Female	7,806	19,324	27,130
	B.sexes	19,152	37,130	56,282
Fuel Sales	Male	3,686	6,895	10,581
	Female	2,599	4,994	7,593
	B.Sexes	6,285	11,889	18,174
Crafts	Male	9,315	12,748	22,063
	Female	13,836	15,182	29,018
	B.Sexes	23,151	27,930	51,081
Trade	Male	14,433	31,047	45,480
	Female	15,607	26,807	42,414
	B.Sexes	30,040	57,854	87,894
Civil Service	Male	6,135	10,523	16,658
	Female	6,572	8,601	15,173
	B.Sexes	12,707	19,124	31,831
Other Non-Cultivators	Male	2,742	5,994	8,735
	Female	4,685	7,772	12,457
	B.Sexes	7,427	13,766	21,193
Total	Male	921,246	1,674,464	2,595,710
	Female	848,968	1,601,997	2,450,965
	B.Sexes	1,770,214	3,276,461	5,046,675

App.Table 16 Distribution of Total (raised) Number of Children by Sex, Broad Age Group (in months) and Altitude

Altitude	Sex	Age Group (in months)		
		6 - 23	24 - 59	6 - 59
800-1599m	Male	111,253	200,955	312,208
	Female	112,677	176,331	289,006
	B.Sexes	223,930	377,286	601,216
1660-2399m	Male	492,583	885,521	1,378,109
	Female	444,807	883,107	1,327,914
	B.Sexes	937,395	1,769,628	2,706,023
2400-3199m	Male	220,465	419,867	640,332
	Female	207,528	377,189	584,717
	B.Sexes	427,99s3	797,056	1,225,040
800-3199m	Male	824,306	1,505,343	2,330,649
	Female	765,012	1,436,627	2,201,639
	B.Sexes	1,589,318	2,942,970	4,532,286

App.Table 17 Total Number Children (raised) by Sex, Broad Age Group (in months) and Main Agricultural Product at FA level.

Agricultural Product	Sex	Age Group (in months) 6 - 23 Number	%	24 - 59 Number	%	6 - 59 Number	%
Cereals	Male	713,685	52.8	1,224,620	50.7	1,938,305	51.4
	Female	638,390	47.2	1,192,403	49.3	1,830,793	48.5
	B.Sexes	1,352,075	100	2,417,093	100	3,769,098	100
Roots	Male	35,541	48.3	93,540	55.3	129,081	53.2
	Female	38,106	51.7	75,647	44.7	113,753	46.8
	B.Sexes	73,647	100	169,187	100	242,834	100
Coffee	Male	14,168	51.1	28,181	52.4	42,349	51.9
	Female	13,556	48.9	25,623	47.5	39,185	48.1
	B.Sexes	27,724	100	53,809	100	81,534	100
Cattle	Male	6,158	52.0	16,699	53.9	22,857	53.4
	Female	5,678	48.0	14,304	46.1	19,982	46.6
	B.Sexes	11,836	100	31,003	100	42,839	100
Cereal +	Male	71,404	51.3	145,089	51.5	216,493	51.4
Roots	Female	67,786	48.7	136,693	48.5	204,479	48.6
	B.Sexes	139,190	100	281,782	100	420,972	100
Crereal +	Male	17,362	47.8	36,222	47.2	53,584	47.4
Cash Crop	Female	18,233	52.2	40,577	52.8	59,510	52.6
	B.Sexes	36,295	100	76,999	100	113,094	100
Other	Male	65,579	49.2	136,522	52.5	202,101	51.4
	Female	67,838	50.8	123,343	47.5	191,181	48.6
	B.Sexes	133,417	100	259,865	100	393,282	100
Total	Male	928,898	52.1	1,680,874	51.1	2,604,772	51.4
	Female	850,288	47.9	1,608,595	48.9	2,458,883	48.5
	B.Sexes	1,774,186	100	3,289,469	100	5,063,655	100

App.Table 18 Total Number Children (raised) by Sex, Broad Age Group (in months) and Ethnic Group of Mothers

Ethnic group of mothers	Sex	Age Groups (in months)		
		6 - 23	24 - 59	6 - 59
Amhara	Male	303,632	490,211	793,843
	Female	263,718	470,531	734,249
	B.Sexes	567,350	960,742	1,528,092
Gurage	Male	40,407	93,078	133,485
	Female	51,051	83,014	134,065
	B.Sexes	91,458	176,092	267,550
Tigraway	Male	59,042	113,058	172,100
	Female	48,431	121,002	169,433
	B.Sexes	107,473	234,060	341,533
Agew	Male	6,506	16,710	23,216
	Female	4,949	14,389	19,338
	B.Sexes	11,455	31,099	42,551
Kimant	Male	4,862	13,097	17,959
	Female	5,265	9,457	14,722
	B.Sexes	10,127	22,554	32,681
Oromo	Male	276,682	491,139	767,821
	Female	262,582	472,615	735,197
	B.Sexes	539,264	963,754	1,503,018
Borena	Male	4,395	9,592	13,987
	Female	2,674	8,995	11,669
	B.Sexes	7,069	18,587	25,656
Guji	Male	9,219	28,170	37,389
	Female	12,771	26,414	39,185
	B.Sexes	21,990	54,584	76,574
Konso	Male	9,360	12,093	14,379
	Female	5,019	11,027	16,046
	B.Sexes	14,379	23,120	20,419
Sidamo	Male	44,183	94,335	138,518
	Female	35,845	84,385	120,230
	B.Sexes	80,028	178,720	258,748

App.Table 18 (Contd.)

Ethnic group of mothers	Sex	Age Groups (in months)		
		6 - 23	24 - 59	6 - 59
Gedeo	Male	18,118	38,869	56,987
	Female	17,382	38,912	56,294
	B.Sexes	35,500	77,781	113,281
Hadya	Male	20,431	50,551	70,982
	Female	20,410	44,625	65,035
	B.Sexes	40,841	95,176	136,017
Kembata	Male	12,636	24,473	37,109
	Female	12,574	30,860	43,434
	B.Sexes	25,210	55,333	80,543
Ari/Ara	Male	4,993	10,933	15,926
	Female	4,842	10,406	15,248
	B.Sexes	9,835	21,339	31,174
Gimira/She	Male	4,010	8,319	12,329
/Bencho	Female	5,318	8,873	14,191
	B.Sexes	9,328	17,192	26,520
Kefa	Male	9,647	19,863	29,510
	Female	8,299	11,926	20,225
	B.Sexes	17,946	31,789	49,735
Gamo	Male	12,671	26,418	39,089
	Female	14,047	27,315	41,362
	B.Sexes	26,718	53,733	80,451
Welaita	Male	25,145	51,055	76,200
	Female	32,273	45,064	77,337
	B.Sexes	57,418	96,119	153,537
Others	Male	43,075	76,765	119,840
	Female	31,961	75,728	107,689
	B.Sexes	75,036	152,493	227,529
All Ethnic	Male	909,013	1,668,728	2,577,741
Groups	Female	839,409	1,595,537	2,434,946
	B.Sexes	1,748,422	3,264,265	5,012,687

App. Table 21 Percentage Share of Households in each Region Before & After Introducing Sample Weight

Region	Unweighted	Sample weight	Adjusted sample weight
Arsi	4.5	6.0	6.6
Bale	3.5	2.1	1.9
North Omno	6.8	8.7	7.6
South Omo	2.2	.4	.5
East Gojam	5.6	5.4	4.6
West Gojam	5.3	7.0	6.0
Metekel	2.6	.6	.7
North Gonder	5.0	2.7	3.9
South Gonder	2.8	3.7	4.7
Ilubabor	6.1	7.0	6.2
Kefa	5.5	3.0	2.7
North Shewa	2.2	2.8	5.6
East Shewa	3.8	1.7	2.0
West Shewa	5.3	8.2	8.4
South Shewa	6.0	10.1	8.7
Addis Ababa	4.8	1.3	1.2
Sidamo	6.4	8.8	8.0
Borena	3.3	2.0	2.1
Tigray	6.4	7.2	6.2
Welega	4.2	3.0	4.8
North Welo	4.1	2.2	2.1
South Welo	3.7	6.0	5.5
Total	100.0	100.0	100.0
Total households	14,845	3,167,911	3,673,372

CENTRAL STATISTICAL AUTHORITY

NATIONAL NUTRITIONAL SURVEILLANCE SYSTEM
RURAL NUTRITION SURVEY, CORE MODULE - 1992

STUDY NO | 1 | 2 | 3 |
N | O | 1 |

SECTION 1 - IDENTIFICATION PARTICULARS

1. AUT./ADM. REGION	4	5	2. AWRAJA / ZOBA	6	7	3. WEREDA	4. FARMERS ASSOCIATION/COMMUNITY	8	9	10	5. ORDER OF SELECTION	11	12	6. MAIN AGRI. PRODUCE OF THE AREA	13	7. ALTITUDE OF THE AREA	14	8. MAIN ENDEMIC DISEASE	15

SECTION 2 - DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS OF HOUSEHOLD

AVAILABILITY OF FOOD IN THE F.A						11. HOUSE-HOLD SIZE			12. NUMBER OF CHILDREN UNDER FIVE		13. SEX OF HEAD OF HOUSEHOLD (1 = MALE 2 = FEMALE)		14. AGE OF HEAD OF HOUSE-HOLD		15. EDUCATIONAL ATTAINMENT OF HEAD OF HOUSE-HOLD		16. MAIN SOURCE OF INCOME / LIVELIHOOD OF HEAD OF HOUSEHOLD			17. SIZE OF CULTIVATED LAND BY HOUSEHOLD					18. TYPE OF WATER SUPPLY OF HOUSEHOLD	
9. MONTH OF MAXIMUM SUPPLY	16	17	10. MONTH OF MINIMUM SUPPLY	18	19			20	21	22		23		24	25		26		26	27	IN LOCAL UNIT	IN HECTAR	28	29	30	31	32

SECTION 3 - CHILDREN'S DEMOGRAPHIC, HEALTH AND NUTRITION PARTICULARS

19	20	21	22			23	24			25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		40	
SERIAL NUMBER	NAME OF HOUSEHOLD MEMBERS AGED UNDER FIVE YEARS (ACCORDING TO THEIR AGE SEQUENCE)	SEX (1=MALE 2=FEMALE)	AGE IN COMPLETED YEARS AND MONTHS			CHILD'S MOTHER RELIGION	CHILD'S MOTHER ETHNIC GROUP			EDUCATIONAL ATTAINMENT OF CHILD'S FATHER	EDUCATIONAL ATTAINMENT OF CHILD'S MOTHER	AGE OF CHILD'S MOTHER (IN COMPLETED YEARS)	ARE CHILD'S PARENTS IN MARITAL UNION (1=YES 2=NO)	BIRTH ORDER OF THE CHILD	WHAT WAS THE CHILD GIVEN AT BIRTH?	AGE AT WHICH THE CHILD STARTED BREAST-FEEDING (IN HOURS)	IS THE CHILD BEING BREAST-FED (1=YES 2=NO)	IF NO TO "32" AGE AT WHICH BREAST-FEEDING STOPPED	TYPE OF FOOD GIVEN TO THE CHILD DURING LAST 4 WEEKS	IF FED OTHER THAN BREAST-MILK, AGE (IN MONTHS) AT WHICH IT WAS STARTED	WAS CHILD SICK DURING LAST 14 DAYS?	IF SICK, TYPE OF DISEASE	MOTHER'S OPINION ON CHILD GROWTH	FOR CHILDREN AGED 6-59 MONTHS ONLY			
			YEAR	MONTHS																				HEIGHT (IN CM TO FIRST DECIMAL PLACE)		WEIGHT (IN KG TO FIRST DECIMAL PLACE)	
33	34	35	36	37	38	39		40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
0	1																																	
0	2																																	
0	3																																	
0	4																																	
0	5																																	

COLUMN-23
1. ORTHODOX
2. PROTESTANT
3. CATHOLIC
4. MOSLEM
5. OTHER RELIGION
6. PAGAN
7. ATHEIST

COLUMN-15, 25, 26
0. ILLITERATE
1. LEVEL NOT DEFINABLE
2. GRADES 1-2 COMPLETED
3. GRADES 3-4 "
4. GRADES 5-6 "
5. GRADES 7-8 "
6. GRADES 9-10 "
7. GRADES 11-12 "
8. COMPLETED ABOVE GRADE 12

COLUMN-30
1. BREAST MILK
2. WARM WATER
3. BUTTER (FRESH)
4. FENUGREEK
5. MILK
6. OTHER

COLUMN-34
0. BREAST-MILK ONLY
1. OTHER MILK OR OTHER ANIMAL PRODUCTS
2. CEREALS
3. ENSET / FALSE BANANA
4. VEGETABLE / FRUIT / OTHER ROOTS
5. 1+2 / 1+3 / 1+4
6. 2+3 / 2+4
7. 3+4
8. MORE / MULTI-MIX

COLUMN-36
0. NOT SICK
1. SICK FOR ONE DAY
2. SICK FOR 2-4 DAYS
3. SICK FOR 5-7 DAYS
4. SICK FOR 8-10 DAYS
5. SICK FOR 11-14 DAYS

COLUMN-37
00. SWOLLEN BODY
01. DIARROEA
02. VOMITING
03. FEVER
04. WHOOPING COUGH
05. OTHER COUGH
06. MEASLES
07. 01 + 02
08. MALARIA
09. OTHER

COLUMN-38
1. NORMAL GROWTH
2. POOR GROWTH
3. DO NOT KNOW

REGIONAL HEAD	NAME	SIGNATURE	DATE
SUPERVISOR	NAME	SIGNATURE	DATE
ENUMERATOR	NAME	SIGNATURE	DATE