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Case Study. Ethiopia

Linking Food Security and Nutrition

April 1998

**Paper compiled for USAID and
the Greater Horn of Africa Initiative**

by

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Table of Contents

	List of Acronyms	v
I	INTRODUCTION	1
II	PROBLEM OVERVIEW NUTRITION PROFILE OF ETHIOPIA	1
	A Anthropometric Data (Stunting, Wasting, Underweight, and BMI)	2
	B Micronutrient Deficiencies	3
	Vitamin A deficiency	3
	Iodine deficiency disorders	4
	Anemia	4
	C Nutrition in Emergency Situations	5
	Current Refugee Situation	5
	Nutrition in Ethiopian Famines	5
III	FOOD SECURITY CONTEXT IN ETHIOPIA	6
	A Food Production and Consumption Availability and Access	6
	1997–1998 Current Reports	6
	Land, Food, and People Food Security Foundations	6
	B Health Utilization	11
IV	CRITICAL CONNECTIONS FOOD SECURITY AND NUTRITION	12
	A Chronic Food Insecurity Development and Nutrition	12
	Food Availability, Access, and Utilization	12
	Production and Marketing	13
	Production and Consumption	14
	Income	14
	Access to Credit	15
	Labor Demands and Consumption	15
	Food-based Approaches to Micronutrient Deficiencies	16
	Behavior Change and Education	16
	Food Aid	17
	B Acute Food Insecurity—Refugees, Disasters, and Nutrition	17
	Drought	17
	Conflict	18
V	OVERVIEW AND CONCLUSION	18

List of Acronyms

BMI	body mass index
CSA	Central Statistical Authority
DHS	Demographic Health Surveys
ENI	Ethiopia Nutritional Institute
GHA	Greater Horn of Africa
GHAJ	Greater Horn of Africa Initiative
IDD	iodine deficiency disorders
MCH	maternal and child health
MICS	multiple indicator cluster survey
MOH	Ministry of Health
NID	National Immunization Days
NNSS	national nutritional surveillance system
OMNI	Opportunities in Micronutrient Interventions
PEM	protein-energy malnutrition
TBA	traditional birth attendant
TGR	total gorter rate
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VAC	vitamin A capsule
VAD	vitamin A deficiency

I INTRODUCTION

As part of the Greater Horn of Africa Initiative (GHAI), USAID has committed to enhancing African capacity to implement household level nutrition and other child survival interventions. Important to this enhancement is a recognition of the critical interconnections between mechanisms of food security, nutritional status, and other child survival interventions. USAID defines food security as "when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life." There are three essential components under this definition: availability of food, access to food, and the proper utilization of food. Nutritional status of a population is commonly associated with the utilization component of this definition. However, the following analysis focuses on the interrelationships found between food availability (agricultural production, marketing, technology, local resource endowments, policy), food access (marketing, income, policy), and food utilization (health, knowledge, intrahousehold allocation, cultural practices) in Ethiopia and nutritional status, especially as this relates to child survival. Coordination of effort across sectors should have not only a dramatic impact on the effectiveness of various interventions but should reduce the overall cost of development efforts to both donors and host countries alike through a reduction of duplicate or contravening efforts.

II PROBLEM OVERVIEW NUTRITION PROFILE OF ETHIOPIA

One key nutritional problem for Ethiopia is very high levels of stunting (64.9 percent) of children under age six, especially those in rural areas (IBRD, 1994/95). These rates are among the highest in the Greater Horn of Africa (GHA) region. One quarter of adults were found to be undernourished with a body mass index (BMI)¹ of less than 18.5 (CSA 1995/96). For children, wasting is noted as a severe problem with three regions exhibiting wasting rates of greater than ten percent. Two regions, East Gojam and Tigray, showed high rates of both stunting (>66 percent) and wasting (>10 percent).

Taken together, deficiencies of the micronutrients vitamin A, iodine, and iron affect the mortality and morbidity levels of a much greater number of people worldwide than protein-energy malnutrition (Chandra 1990). The key micronutrient problems found in Ethiopia are **vitamin A** and **iodine deficiencies** affecting as many as 5 and 11.5 million Ethiopians respectively. While data are sparse, iron deficiencies are noted as probably below regional averages and, when found to occur, appear related to parasitic infections such as malaria and intestinal worms. Only a limited number of recent studies have been completed and one of the other key problems identified is lack of current micronutrient data, especially for pastoralists.

Analysis of land under cultivation and population show that on average Ethiopians have access to only approximately 1650 kcal/day/cap (UN 1996, Diriba 1995) far short of the recommended 2100 kcal diet. However, these aggregate statistics for food availability mask the differences found within both the highlands and the lowlands. For example, Webb et al 1992 found as expected calorie consumption differences across income lines but even more significant differences between communities reflecting different production mixes and natural resource endowments.

¹ Body Mass Index (BMI) is the anthropometric measurement for malnutrition in adults. BMI is equal to weight in kilograms squared divided by height in meters squared. $BMI = \text{weight (kg)}^2 / \text{height (m)}^2$

A Anthropometric Data (Stunting, Wasting, Underweight, and BMI)

During the last fifteen years, only four national surveys have been conducted in Ethiopia examining the nutritional status of young children under the age of five years (Central Statistical Authority, 1983, 1995/96, 1992, IBRD 1994/95) The most recent of these showed that stunting (Height for Age, H/A) affects on average 64.9 percent of children under six. Urban populations are somewhat less affected, with only 56.3 percent exhibiting signs of stunting compared to 68.7 percent of rural children. Wasting (Weight for Height, W/H) is also high affecting 9.3 percent of urban and 10.4 percent of rural children. Results of the 1995/6 study are consistent with earlier studies, though they do show that nutritional status has declined in recent years (see Table 1). This latest study included over 12,000 households and concluded that one-third of all child mortality in Ethiopia is associated with direct or underlying nutritional problems such as protein-energy malnutrition or various micronutrient deficiencies.

Malnutrition was found to be slightly higher for male than for female children as measured by all three anthropometric indicators. Children ages 6–24 months showed the highest rates of stunting and underweight malnutrition, while wasting prevalence peaked with children ages 24–35 months.² One should also note that there is a trend in Ethiopia of rising levels of stunting since the 1983 CSA survey. As seen elsewhere in the world, there is a strong association between levels of malnutrition faced and the key socioeconomic indicators, household income levels (see BMI discussion below), and educational levels of mothers.³ Educational levels in Ethiopia are extremely low—only two percent of mothers reportedly have completed primary school compared to 12 percent of fathers. Larger households in both rural and urban areas exhibited lower nutritional status for all three nutritional indicators.

On a regional basis, the 1992 survey reported that stunting and wasting rates were highest in the following regions (CSA Rural, 1992)

<u>Stunting (above 66 percent)</u>	<u>Wasting (above 10 percent)</u>
East Gojam	East Gojam
Tigray	Tigray
Sidamo	Borana
West Gojam	
Ilubador	
North and South Gondar	
South Shewa	
North Welo	

Only two regions, East Gojam and Tigray, suffer from high rates of both stunting and wasting.

² Wasting prevalence generally peaks at an earlier age in developing countries. This may be a consequence of some problem particular to Ethiopia for children this age (i.e. effects of civil war, famine, etc.)

³ Two caveats were made for the statistical relationship determined for nutritional status and educational level: 1) very few mothers in Ethiopia have completed primary school; 2) there were no controls in the analysis made for income, health, etc. as related to educational level and nutritional status.

Table 1 Prevalence of Stunting and Wasting for Children (<6 years)⁴

	CSA, Rural		World Bank, Rural 1994/95			CSA, 1995/96	
	1983	1992	Round 1	Round 2	Round 3	Urban /Rural	Total
Stunting	59.8	64.2	53.5	56.9	55.9	56.3/68.7	64.9
Wasting	8.1	8	10.4	10.7	13.7	9.3/10.4	10.8

One-quarter of all adults in Ethiopia have a body mass index of less than 18.5 and can be considered undernourished (CSA 1995/96). However, again, the socioeconomic indicator of income level is strongly evident. One-third of adults living in low-income households are undernourished compared to the one-fifth malnourished adults living in wealthier households. A higher coefficient of variation for BMI nutritional status was found for women than for men. These findings indicate that women, in part due to the nutritionally stressful conditions of pregnancy and lactation are more vulnerable to seasonal changes and shocks to their nutritional status.

B Micronutrient Deficiencies

Vitamin A deficiency (VAD)

VAD is estimated to affect five million children in Ethiopia (World Bank 1997). The Government of Ethiopia puts the estimate more conservatively at 1–1.5 million children. VAD varies by region and by ecological zones, but is particularly widespread in pastoral areas and in the agro-ecozones characterized by the least degree of household crop mix diversity. Factors contributing to vitamin A deficiency in Ethiopia include inadequate intakes of vitamin A and its precursor β -carotene, and high infection rates (upper respiratory infections, diarrhea, etc) that affect absorption, mobilization, and excretion of vitamin A in the body. The last national xerophthalmia survey was conducted in 1980. The prevalence of Bitot's spots, a clinical sign of vitamin A deficiency, was 1 percent nationally, 1.6 percent in pastoral zones, and 1.1 percent in cropping areas (WHO 1993). A number of subnational surveys also have been carried out over the past two decades.

Breastmilk may be the most important source of vitamin A for infants and young children. Studies in Ethiopia have shown a significant positive correlation between prolonged breastfeeding (up to three years of age) and reduced incidence of VAD (Tafesse, 1996). While prolonged breastfeeding is still the norm in rural areas, duration of breastfeeding in urban areas is on the decline, indicating a potential need to target urban populations with education and media efforts (Wolde-Gabriel 1991). Equally important is the use of colostrum. However, available data suggest the widespread practice of colostrum rejection, with newborn infants being fed other liquids or in some cases butter until breastmilk is available.

⁴ The first study undertaken in 1982/83 did not include Northern Ethiopia due to security reasons. The sampling frame of the World Bank study in 1994/95 came only from the three major ecological zones - Northern, Central and Southern Ethiopia. Pastoralist communities and smaller zones were not included in the study and indeed are seldom assessed.

Children three to six years old are at higher risk for VAD than children under three years old. Boys are more likely to be deficient than girls (Tafesse, 1996). Targeting primary school children, as well as children under five years old, may be important for preventing blindness—an extreme outcome of VAD (Repola 1991). Results from subnational surveys found a significant association with income, general nutritional status, and VAD.

An estimated 5–20 percent of the children 6–60 months old who were at risk for VAD were receiving vitamin A supplements through high-dose supplementation efforts (UNICEF 1995). The MOH is now combining vitamin A capsule distribution with National Immunization Days (NIDs) to increase coverage of children under five years old.

Iodine deficiency disorders (IDD)

IDD in some form directly affect 11.5 million Ethiopians and an estimated 25 million are at risk of deficiency. The 1990 national IDD prevalence survey estimated that 35,000 cretins are present in Ethiopia today. The total goiter rate (TGR), which measures one of the physical manifestations of IDD among school children six to eleven years old, was 22 percent (WHO 1993). The highest prevalence of TGR was found in the mountainous regions of Arsi, Gojam, Gonder, and Wollega. The overall trend represents an eight percent decrease in IDD since 1981 (WHO 1993).

Although UNICEF estimates that virtually no households (0.2 percent) were receiving iodized salt in 1995 (UNICEF 1998), there has been significant cross-border trade with adequately iodized salt from Eritrea since the UNICEF-assisted multicenter survey was carried out in June of that year. Through USAID support, the two main Eritrean salt producers are now iodizing their salt according to Codex Alimentarius specifications. It is estimated that between 80–85 percent of all salt in Ethiopia comes from Eritrea in iodized form. At present, the impact of imported iodized salt on Ethiopian people is unknown. Eritrea now exports iodized salt to other GHA countries. It is anticipated that IDD could be reduced significantly over the next three to five years in the region using a combined strategy of in-country salt iodization, purchase of imported iodized salt, and education/social marketing. Certain constraints still will need to be addressed such as the level of salt consumption for the general population, the availability of iodized salt in rural areas, and the need to produce incentives to buy iodized salt.

Anemia

Among Ethiopian adults, rates of iron deficiency are presumed to be relatively low due to the naturally high iron content of the diet. Teff, the staple food, is rich in iron and largely enriched from the soil. National prevalence data for iron deficiency are not available. In one subnational study, 8.2 percent of adult women were found to be iron deficient (low hemoglobin). Anemia among pregnant and lactating women is estimated at 17 percent, considerably below the regional averages (MOH 1998). The situation is somewhat different for children. A periurban hemocrit survey of young children (6–72 months old) showed a 47 percent prevalence of anemia, and a survey in the rural town of Ijajaj found a similar rate (48 percent) among preschool children (OMNI, 1996). The etiology of the anemia is from malaria, intestinal worm infestation, and poor bioavailability of the diet. More data are needed to determine the extent and severity of anemia in Ethiopia.

C Nutrition in Emergency Situations

Current Refugee Situation

By the close of 1997, there were approximately 394,000 refugees in Ethiopia (278,000 Somali, 53,000 Sudanese, 8,700 Kenyan, 18,000 Djibouti, 11,000 internally displaced around Addis Ababa, 25,000 internally displaced in Dollo region, including 10,000 in Gode) (RNIS 1997). Among these refugee populations, several nutritional problems were found as demonstrated by high rates of wasting.

Despite a decreasing trend in the levels of wasting in Somali refugee camps, wasting rates are still extremely high at 8.5–19.2 percent (August 1997) and the overall nutritional status remains poor. There has been some question as to whether the reduction in the general ration being distributed in eastern camps should have been implemented due to the continuing malnutrition problems. The ration was reduced in January 1997 by 100–200 kcal per person per day. In Western Ethiopia, rations were cut even more dramatically from 2,150 kcal to 1,600 kcal per person per day on the assumption that Sudanese refugees had attained a greater degree of self-sufficiency. Wasting in these camps, however, remains unacceptably high at 10.8–27.2 percent. The nutrition situation at the Fugnido refugee camp is most dire, where rations are as low as 1,447 kcal per person per day (RNIS, 1997).

Other problems contribute to the malnutrition found in refugee camps. Drought, insufficient water catchment systems, and broken pumps cause water scarcity complications. Flooding has been reported in the Gode region of Ethiopia, preventing supplies from being transported to populations. Communicable disease, measles, and poor sanitary conditions are exacerbating nutritional problems. Measles immunization coverage varied in 1997 from 30.9–97.2 percent in camps.

Nutrition in Ethiopian Famines

Recent studies have examined the kinds of malnutrition are most apparent during the two widespread famines of Ethiopia, 1973–74 and 1984–85 (Kloos, et al 1994). The findings could prove useful for identifying potentially vulnerable population groups and for designing and implementing future emergency, rehabilitation, and mitigation programs in the country.

Protein-energy malnutrition (PEM) was the most common nutritional problem during Ethiopian famines, accompanied by micronutrient deficiencies. Marasmus occurred primarily among nomadic pastoralist and seminomadic or settled agropastoralist populations, whose milk-based diets were deficient in carbohydrates. These problems were identified in the southern regions of Shewa, Bale, Sidamo, Gamo, and Gofa. Wasting prevalence was also very high among pastoralists, reaching 73 percent among the Surma pastoralist children in Keff in the year 1987. Kwashiorkor was found mostly in the major enset⁵ growing regions of the country such as Wolayta and Kembata awrajas, where diets are deficient in protein. Stunting was reported as higher among farming communities, a similar finding to those of famine situations in Sudan and West Africa. Vitamin A deficiencies were identified in those grain growing areas of Arsi, Bale, and Gamo Gofa in which crop production diversity is extremely limited.

⁵ Enset, otherwise known as false banana, is drought resistant, high-energy yield crop. The plant which takes 7–8 years to mature is generally planted by men in home gardens and tended by women. It is grown mostly in Ethiopia, Kenya, and Brazil. Maize is gradually replacing enset in Ethiopia.

The most severe malnutrition problems were found in emergency shelters and refugee camps. All forms of malnutrition were identified including vitamin A deficiencies, B deficiencies, and scurvy, which is normally rare in Ethiopia. The problems had been complicated by the health problems of communicable diseases, malaria, overcrowding, poor sanitary conditions, and lack of potable water.

III FOOD SECURITY CONTEXT IN ETHIOPIA

The current food security situation in Ethiopia, though improving, is still of considerable concern and in need of significant improvement. Despite recent increases in aggregate crop production levels, Ethiopians still face significant levels of food insecurity as evidenced by high levels of malnutrition and by per capita food production well below past levels and current needs.

A Food Production and Consumption Availability and Access

1997–1998 Current Reports

Though in the last three years there has been a slight increase in per capita food production, an ever-increasing population has meant that despite increasing aggregate production, per capita production of food is still significantly lower than levels seen in the 1960s (240.2 kg/cap/year in 1961 had dropped to only 97.37 kg/cap for 1993) (Diriba 1995: 42, FAO 1998). It is impressive that any gains were possible given that the total area of crop land has remained stable, while hectares of cropland per capita fell from 0.36 in 1983 to only 0.27 in 1993 (WRI/UNEP 1996). The production increases were likely due to noted increases in the level of fertilizer used from 1 to 6 kg/hectare during the same period (UN 1996).

Unfortunately, this year, despite initial forecasts of good harvests, the latest reports from Ethiopia note that severe and excessive rainfall struck a considerable portion of Ethiopia in late October 1997, shattering or drowning much of the teff and some of the wheat and barley of the belg (secondary rainy season) crops. The little grain harvested is said to be sprouting and essentially useless. USAID/FEWS notes that there will be "significant reduction in the harvest in the major production areas of Ethiopia" (FEWS fb/10-1997). Although the meher (main season) harvest was good, this failed belg season harvest has significantly increased the level of food insecurity for regions such as highland Southern Tigray, North Wollo, South Wollo, and North Shewa. Given this flooding,⁶ the worst since 1961, it is expected that large amounts of food aid needs be imported and indeed is currently being distributed to "1.4 million vulnerable people in 19 zones of Tigray, Oromiya, and the Southern Regions" (FEWS 1997).

Land, Food, and People Food Security Foundations

Agriculture

Agriculture contributes 55 percent of the GDP in Ethiopia, while 85 percent of the population is employed in the sector. For the vast majority of Ethiopians, food security depends greatly upon household

⁶ Recent evidence suggests that this flooding is not a product of El Niño weather variation (as previously thought) but of a similar phenomenon with anomalously cool sea surface water in the mid-Indian Ocean. The last time this cool water pattern was seen (NOAA 1998) was the last time floods of this magnitude were experienced in East Africa.

production of sufficient crops and livestock for both home consumption and limited sales. Within the rural economy, farmers depend on basic technology (hand hoe or light-weight portable plows) and limited technological inputs. Households in all ecozones and of all production types are noted to each utilize diverse sources of income. In highland agricultural systems, the three greatest sources of income within each household are cropping (averages 54 percent of total income for each household), livestock (sales of meat, milk, eggs, skins) (18 percent), and wage labor (11 percent). In lowland agricultural systems, reflecting a more limited agricultural resource base, households depend on cropping (47 percent), livestock (9 percent), and the collection, processing, and sale of fuel products such as firewood and charcoal (35 percent). Pastoralists are noted to gain the greatest proportion of income from livestock (52 percent), cropping (20 percent) and wage labor (13 percent). Income levels for most of Ethiopia are low enough that households are often classified as "poor", "poorer", and the "very poor" (Webb and von Braun 1994: 62).

Rural household estates are noted as extremely fluid and generally controlled by adult males. However, female headed households⁷ consistently account for at least 15 percent of all households. In ox-plow regions especially, these female headed households are found in the lowest income brackets (McCann 1995: 74–75) due to lack of access to the oxen required for plowing. Indeed, access to draft animals appears to be strongly correlated with lower levels of poverty.

Land Tenure

In 1975, government land reform measures nationalized all rural lands and ended the feudal system. Tenancy was abolished and "landless" peasant farmers were given control of their lands. Unfortunately, they no longer had access to the agricultural support provided by landlords, and thus production stagnated. In the 1970s and 1980s, there was a large push for forced resettlement through large scale villagization campaigns, moving farmers, and attempting to permanently settle pastoral groups and convert them to farming.

In practice, local variation exists due to the land tenure history of particular areas.⁸ The government has assured small holders that equitable distribution of land will be made where "unfair allotments" were earlier made. However, despite these assurances the government of Ethiopia is also apparently adamant that no further land redistributions will take place. Under land reform measures farmers cannot sell or exchange land, but they can rent it (according to some reports), give it to family members, hire labor to work their lands and sell the produce therefrom.

⁷ These are households headed by women who are divorced, separated, widowed, never-married with children, or whose husbands are migrant laborers.

⁸ The Ethiopian land tenure systems, though statutorily uniform, is quite diverse in actual practice. The most often discussed land tenure systems in Ethiopia were the old feudal systems of tenancy found in the south. Araia (1995: 8) notes that in Wollo alone it is believed that there were about 111 feudal systems at work. In the north, however, land tenure was based on an extended family system where claims to land were made and held through lines of patrilineal descent. There were also extensive village and communal lands. Patrilineal lands could not be alienated from the lineage and land sales were not permitted, though temporary lease and mortgage were allowed.

Socioeconomic Variation

Ninety percent of the population of Ethiopia is concentrated in the highlands and in part comprise the ethnically diverse Amhara, Oromo and Tigray, and Sidama ethno-linguistic groups. The highlands comprise diverse agro-ecological zones as can be seen in the great variety of crop mixes and production strategies and capabilities. Some of smallholder farmers grow and consume teff, barley, wheat, sorghum, maize, peas, and beans and raise some livestock such as cattle, goats, and sheep (Wubneh & Abate 1988). The natural resource base varies considerably between areas and despite similar crop mixes some cultivators such as the Tigray are more constrained. They have access only to seriously eroded and exhausted soils and as such have yields lower than national averages.

Both settled farmers and pastoralists can be found in the south, west, and central regions of Ethiopia. In southwestern Ethiopia, one of the most densely populated regions, though one of the most fertile, inhabitants produce grains, enset, and non-food cash crops such as coffee and tobacco in addition to raising some livestock (cattle, horses, and sheep) (ibid). The people of this region comprise a number of ethnic groups and a number of different religions. To the north of this region are found the primary hoe-based horticultural group, dependent on enset production and other vegetable and root crops. Again, as with the other socioeconomic systems described, these societies are highly diverse in ethnic and religious affiliation.

The lowlands of Ethiopia are inhabited by settled farmers, seminomadic agro-pastoralists, and nomadic pastoralists. Settled farmers utilize a variety of crop mixes such as tubers and maize, maize and beans, millet and teff, or maize and sorghum, among others (Webb, von Braun, and Yohannes 1992: 138). In some areas (of both the highlands and the lowlands) the hand-hoe is the predominant cultivation technology used, while in others it is the ox-plow.

Labor Demands and Nutrition

Another source of variability to be considered which is found in Ethiopia is directly related again to subsistence systems and ecological setting. The pattern of labor demands and potentially the likelihood for nutritional stress varies in part according to whether the hoe or the plow are the predominant technology used for field preparation, and whether agriculture or pastoralism is practiced. Harsher environments, less amenable to agriculture require more work for field preparation. If amenable to the plow, then this heavy task falls almost exclusively to the men of the household. In hoe areas, both men and women will participate. Energy requirements jump considerably in the months of field preparation. In areas with two planting seasons this is exacerbated. However, in some agro-ecozones staggered planting throughout the year can work to spread out the labor requirements.

Pregnant women very often participate in such work, but simultaneously do not increase caloric consumption. Thus, women are more at risk during various labor peaks for nutritional deficit and lower birthweight infants (Kennedy and Bours 1993: 13).

In terms of pastoralists, it is noted by Smith (1992) that data for energy expenditure is extremely limited. Energy needs for pastoralists are usually assumed in the literature to be considerably less than those for farmers. However, there are few if any specific field studies to back up these conclusions. Weight loss are highest during the dry season possibly due to the heavy labor requirements of well digging and

maintenance, hauling water for livestock, and having to range further afield each day for pasturage. Food availability decreases during this period as well with milk production cut by more than half. Other peak labor times, especially for women, occur at moving times at the change of seasons when women are responsible for hauling household belongings (on donkeys, camels, etc.) to new locations and then constructing new homesteads.

Food Consumption Patterns

In addition to the crops noted above for each agro-ecological zone, small amounts of fruits and vegetables are consumed in towns and in rural areas during religious festivals. Again the type and amounts of fruits and vegetables consumed varies considerably from one region to the next. Among farming households, milk consumption is low, despite high numbers of milk-yielding livestock. In pastoralist groups, however, milk is an important component of the diet (Repola 1991).

Highland households obtain 72 percent of their daily energy needs from grains, 2 percent from dairy, 19 percent from roots, tubers, and pulses, and 7 percent from sugar and other miscellaneous sources. Lowland households obtain 90 percent from grains, 1 percent from dairy, 8 percent from roots, tubers, and pulses, 0 percent from sugar, and 1 percent from all other sources (Webb and von Braun 1994:91). Diets of households producing less diversity of crops (as seen in the case of lowland households) have access to fewer calories and less vitamin A and have been shown to be under greater nutritional stress with greater evidence of VAD within these households. Though the relative proportions of these figures vary throughout the year, in general pastoralists obtain approximately 50 percent of their daily energy from grains, 35 percent from dairy products, 10 percent from meat, and another 5 percent from foraged foods. For the average pastoral family, this provides an adequate diet in non-drought times (Skin 1992).

Infant and Young Child Feeding Issues

Although there has been no recent Demographic and Health Survey (DHS) conducted in Ethiopia, other studies conducted at the regional and community levels give some indication of the present infant and young child feeding situation. The *National Family and Fertility Survey of Ethiopia* (1990) showed that the practice of breastfeeding is nearly universal (97 percent), with the mean duration being 25.2 months. Other surveys have confirmed these findings and revealed specific problem areas related to breastfeeding (CARE/Ethiopia 1996), (ENI 1990), (Scherbaum 1990).

- widespread practice of colostrum rejection (newborns receive butter for 2–3 days until the breastmilk comes in),
- delayed introduction of weaning foods (as late as one year of age) and often with poor quality foods,
- misconceptions regarding the relationships between sexual practices and breastfeeding,
- poor maternal nutrition during pregnancy and lactation.

Several surveys also demonstrate that there is the problem of late introduction of weaning foods (World Bank 1995/96), (CARE/Ethiopia 1996), (ENI 1990). The Scherbaum study found that almost one-third of

mothers wait until the infant is nine months before introducing supplementary foods to breastfeeding children. Some of the reasons cited for this practice are the belief that "solid foods will give the child worms, especially ascaris", "the child's stool will be foul smelling", and "the child should walk before given solid foods."

It also appears that the quality and quantity of weaning foods in Ethiopia may be inadequate to meet the nutritional needs of young children. Many weaning age children are given spicy foods prepared for the family. Special preparation of weaning foods is uncommon, primarily because the workload of women is already very high. Fruits and vegetables are not usually offered to children for various reasons—lemon juice dilutes the blood, bananas produce extra teeth, etc.

A 1991 survey found that only three percent of children aged 6–24 months old consumed the vitamin A fortified weaning foods *Famix* and *Faffa* (produced by private companies). Five percent of children in this age group were receiving vitamin A through dietary improvement programs (UNICEF 1995). The 1995 UNICEF/GFDRE Multiple Indicator Cluster Survey (MICS) found *Faffa/Famix* consumption had increased to nine percent. Increasingly *Faffa* is being provided to various NGOs for distribution to famine-prone areas and for use in refugee and displaced populations (MOH 1998, MICS 1996). More information on *Faffa/Famix* is needed, such as marketing/promotion, target groups, costs, etc.

Post Harvest Issues

Post harvest losses in storage from one harvest until the next can reach up to 30 percent (1995:66). Consequently, most farmers do not keep their grain reserves in storage that long. To hedge against loss, farmers prefer when possible to convert stored grain harvests to cash or to less perishable or less pest-prone foodstuffs (1995:66). Areas of enset production suffer fewer post-harvest losses, and enset has significant potential for post-harvest storage of up to ten years (Diriba 1995). Further in these areas, much of the harvest is staggered and is often not harvested until needed (especially in the case of root and tuber crops) thus reducing the duration of the hungry season, post-harvest loss, and food insecurity in these regions.

Intra-household Allocation

"The sharing and exchange of food and other goods and services reflect broader rights and obligations in property as well as relationships of gender, age and status" (McCann 1995:65). In examining the issue of food security the context of these rights and obligations cannot be ignored. The critical component of the food consumption system at the household level is control and allocation of household resources of cash and food. Though women are highly engaged in agricultural support roles (weeding, harvesting, storage preparation, seed selection), they are not considered to be, especially in areas dominated by the ox-plow, in control of harvests until the male household-head has allocated segments of harvests to his wife for household consumption.⁹

⁹ Though the literature on this point is unclear and limited, it is unclear as to whether women have household garden crops that are not first under the control of the male household head. Is the husband only in charge of grain crops or legumes as well? Further, how does this change in hand-hoe zones?

In addition to allocation as household food, the male household head will also sell or barter portions of the grain harvest in order to make capital goods purchases (such as fertilizer, equipment, clothing, etc) and meet social obligations within the community. Though he has ultimate authority over the harvest, it is noted that negotiations between husbands and wives often do occur. Once wives have allocated food for household consumption they are able to then use that grain to barter or sell for purchase of alternate foodstuffs, e.g. some wheat might be sold to purchase beans for that week's meals.

Variation and Diversity

As can be seen from this discussion, a general profile of a single agricultural and food consumption pattern in Ethiopia is problematic. In addition to the wide variety of production mixes (livestock, fishing, crops), crop mixes, and cultivation technology used, the climate patterns of the country are highly varied as well. The altitudinal differences (often exploited by farmers) have been widely discussed. However, the differences in the rainfall patterns and consequent planting schedules is not often discussed. Rainfall modality includes not only bimodal (as seen in areas with both meher and belg seasons) but unimodal rainfall patterns with only a single planting season. Within each of these modalities there is considerable difference in the level of mean annual rainfall, with both unimodal and bimodal examples of high and low rainfall zones.

B Health Utilization

Health related problems in Ethiopia also contribute to high rates of malnutrition and food insecurity. Relative to other African nations, Ethiopia has very high rates of infant mortality (113/1,000) and under five mortality (177/1,000). The synergistic relationship between communicable disease (diarrheal, ARI, and measles) and malnutrition is evident in Ethiopia. HIV/AIDS is also a growing problem in Ethiopia, negatively impacting the nutritional status of entire households due to lost production time and increased medical expenditures. The World Bank (1996) cited the four top causes of mortality and life years lost in Ethiopia to be 1) perinatal and maternal conditions, 2) respiratory conditions, 3) measles, and 4) nutritional deficiencies.

Nutrition programs of the Government of Ethiopia have traditionally been part of health policy and programs and thus centralized in the Ministry of Health. The current Health Policy and Health Sector Strategy of the Government of Ethiopia however, plans to decentralize the health services provided in the country. It also attempts to re-orient services from curative to preventative and ensure better access to health programs for all Ethiopians.

Under the new health policy, regional governments are implementing health policy and have financial control of 90 percent of the health budget in Ethiopia. Regional governments are responsible for all health facilities and personnel training centers. More autonomy and participation is also being granted to facilities at the regional, zonal, and village (woreda) levels. At the community level, government health programs have recruited community health agents and traditional birth attendants (TBAs) for over a decade. However, financial support and salaries have been limited.

The national nutrition surveillance system (NNSS) was developed between 1989–91 to provide public information to support longer-term policy and planning decisions related to nutrition. The Central Statistics Authority (CSA) conducts the surveys for the NNSS to provide data on the levels and trends of

nutritional status and associated factors, the geographic and socio-economic distribution of malnutrition and related factors (in order to inform policy), and the likely causes of malnutrition among different population groups (to assist in appropriate intervention planning)

Until 1994, VAC delivery was through the primary health care system as a part of child survival activities within the family health services in most peripheral health units in the country. In high-risk areas prophylactic doses were given and, where VAD was detected in the clinics, it was treated with high dose supplements. The logistic constraints to reaching the more remote areas and the functional limitations of the health service have led the Ministry of Health to consider universal VAC distribution in addition to targeting the high-risk areas (MICS 1996). This has been tried by adding VAC to the routine Expanded Programme on Immunization (also known as EPI PLUS program). Inadequacies in the supply of VAC however, have limited the success of this effort. More recently, the government instituted the National Immunization Day campaign, combined with VAC distribution. A consistent and adequate supply of VAC remains a need for effective vitamin A programming (MICS 1996).

IV CRITICAL CONNECTIONS FOOD SECURITY AND NUTRITION

As noted in Section II, the key nutritional problems faced by Ethiopians are stunting, wasting, vitamin A deficiency, and iodine deficiency. Each of these problems can be addressed not only through specific nutritional interventions but via enhancement of both food security interventions and the overall food security situation. Further, it should be recognized that baseline data gathering (e.g. growth monitoring) and specific nutritional interventions (such as education, breastfeeding promotion, supplementation) will still be key and necessary components of nutritional improvement activities. However, it needs to be recognized that these activities at present are hampered significantly by the same obstacles that hamper improvement of other aspects of food security: poor roads, poverty, limited markets, decreasing crop diversity, etc. Improvement in these areas, though often targeted at food security or economic enhancement can have dramatic impact on the effectiveness of specific nutritional intervention activities.

Adequate food availability and access and appropriate use of food are the issues at the heart of food security. Each of these concepts, availability, access and use, do not represent discrete, separate points of intervention, but rather, complex sets of overlapping relationships. What follows is a review of the various studies completed in Ethiopia that point to or clarify these relationships between food security and nutritional status. Specific up-to-date case studies of lessons learned that relate to the current situation in Ethiopia are limited. "Recent policy reform programs and changes in [Ethiopia] make problematic a strong reliance on earlier studies and data sets" (BASIS 1997:5). Nonetheless, the studies available are consistent and point to several critical connections.

A Chronic Food Insecurity Development and Nutrition

Food Availability, Access, and Utilization

Webb and von Braun (1994) note that food availability is a function of two key areas—available resources and production levels. They define resources as natural, physical, and human and note that improvements in food availability can be achieved in part, through improvements to these various resource bases. Improvements in educational opportunities for people, responsible husbandry of the soil, water, and plants, sustainable use of productive assets all work to maintain or improve food availability.

The second key area is that of production. Improvements to both farm and nonfarm production can work to not only improve food availability but to increase food access for other households facing food deficits.

With market liberalization and the resulting availability of technological inputs and channels for diversification, smallholders are increasingly using inputs and diversifying their income sources. The Government of Ethiopia continues to encourage such changes as part of its national food security strategy.

Different levels of nutritional stress for adults in particular are associated with the technology (hoe or plow) used for field preparation by households. Harsher environments, less amenable to agriculture, require more work for field preparation. If amenable to the plow, this heavy task falls almost exclusively to the men of the household. In hoe areas, both men and women will participate. Energy requirements jump considerably in the months of field preparation. In areas with two planting seasons this is greatly exacerbated. Pregnant women are often not excluded from such work and do not have increased caloric consumption. They are therefore more at risk at these times for nutritional deficit and lower birthweight children (Kennedy and Bouis 1993: 13).

Studies carried out in the late 1980s and early 1990s focused on the general inability of Ethiopia's socialist-centrally planned agricultural policies to significantly enhance household food security (Webb et al 1992, Goyder and Goyder 1988, Gorricke 1989, 1990, Belete et al 1991, Magrath 1991). Webb et al (1992) note that though a multifaceted problem, at the heart of food insecurity is poverty. Their multi-regional study showed that

Although the experience [] differs between households and regions, the underlying conditions that contribute to [food insecurity] in Ethiopia are quite similar: proneness to climate-driven production fluctuations, a lack of employment opportunities, limited asset bases, isolation from major markets, low levels of farm technology, constraints to improvements in human capital, and poor health and sanitation environments (133).

It is clear that most of these constraints are related to agricultural and economic policy. However, as will be examined below, each of these constraints can also affect and be affected by household nutritional status.

Production and Marketing

Agricultural policy can be used to target several of these constraints and thus work to the benefit of food security and ultimately nutritional outcomes. The literature for Ethiopia confirms, as seen in similar situations, that all strategies for improving food security must start with appropriate price-liberalization policies and market liberalization for not only food but labor and capital as well. Policies and research that favor household level income and crop (cash and food) diversification should also be encouraged as should market-enhancing rural infrastructure improvement.

Despite the shortfalls in production noted in Section III, per capita food availability is at its highest level in 15 years. There is little doubt that this has a lot to do with the improved agricultural market and policy environment created during the past few years by the Ethiopian government. Policy changes at the national level have worked to not only help increase food production but to improve the channels through

which this food finds its way to those most in need—at the household level. Since the end of the war in 1993, the Government of Ethiopia has been working with USAID and other donor organizations to institute policy changes first proposed in 1990/91 that deregulated transportation, dismantled parastatal monopolies in basic food grains, and liberalized markets for both production (principally grains) and agricultural inputs (e.g. fertilizer) and credit.

Production and Consumption

The USAID Congressional Presentation for FY1998 noted that several changes had taken place as a result of these policy shifts. The parastatal grain marketing board reduced its market share from 37 percent to only 4 percent. State monopolies on food distribution and sales have been eliminated. Fertilizer distribution and sales by the private sector increased in the importation between 1994 to 1996 of private sector fertilizer from 41,649 tons (MT) to 130,000 tons (MT) (USAID 1997). Price controls are still in effect for fertilizer, petroleum, and drugs but have been lifted for all other retail prices (IBRD 1997). Transport controls have been lifted making a significant impact on regional grain price differentials, transport costs no doubt aided by the push towards infrastructural improvement. Prices paid to the farmer in grain surplus areas have risen by 12 percent to 48 percent, while cost to consumers in deficit areas have been reduced by 6 percent to 36 percent. Export taxes are noted to have been eliminated for all products except coffee, for which exporter licensing fees have been significantly reduced. In terms of working on solutions to food insecurity, the shift towards regionalization within the country will allow for more attention to the varied socioeconomic systems at work in the country.

Agricultural policies which have recently privatized much of the marketing of agricultural production are noted by Christensen (1991) to provide the optimal role for the private sector. Spatial arbitrage (commodity relocation in response to price differentials that allow for profitable transport and sale) is key to ensuring movement of crops from food surplus areas to food deficit areas of the country, an important activity in places such as Ethiopia, where geographic concentration of food production is a key characteristic. This lowers prices in food deficit rural areas and urban areas alike.

Income

In November 1996, a National Food Security Strategy was completed by the Government of Ethiopia. The Strategy, which addresses both acute problems of food insecurity as well as longer-term chronic problems, has two objectives: 1) double per capita income over 15 years, and 2) narrow the "food gap" within five years. It is primarily through agriculture and economic policies that the government plans to address food security. Nutrition interventions are included in the Strategy in conjunction with health interventions through the Ministry of Health. This strategy points to the recognition by policy planners of the impact of poverty on food security in Ethiopia. Increasing income is noted as specifically affecting several areas related to nutritional improvement.

Policies that encourage the creation of food security safety nets for Ethiopia were examined by the World Food Program and were found to be an effective tool for addressing transient food insecurity in the rural areas. Though not specifically agricultural in nature, policies of this type are shown to be effective tools for maintenance of rural roads and other agricultural and marketing infrastructure (Herbinger 1993), thus affecting income, access to health facilities, etc.

Salih (1994: 11) notes that for several countries in sub-Saharan Africa the critical linkage between structural adjustment programs and food insecurity is not from significant food production deficits but from low and unstable incomes. Other studies confirm this link between income and improved nutritional status, especially improved women's income. However, as noted by Meskel and Kassa (1996) income alone cannot improve nutritional status if "behaviors supportive of good health and nutrition and availability of adequate amounts of good quality food [harvested or for purchase], and health care utilization patterns" are not addressed as well.

Access to Credit

Several authors note the link between access by households to credit and small scale (formal and informal) loans to be critical to improving access to agricultural inputs (production increases, seed purchase), access to health care (transport and medicines), and the ability to weather household crop losses (Aredo 1993, Carter 1989, Desta 1992, Kumar 1993, Zeller 1993). One study (Amde 1995) found that in Southern Shoa, Ethiopia found that 45 percent of all households borrowed money, predominantly from informal lenders, and that over half of this money was used for food purchases. The second highest percentage went towards purchase of agricultural inputs such as fertilizer and pesticide. The study shows that "rural households have high seasonal demand for consumption credit to attain food security" and that most are forced to use only informal (and unreliable) credit systems.

Labor Demands and Consumption

While some nutritional studies indicate that other factors beyond food production have a greater impact on determining nutritional status of households, there is evidence that in certain regions of Ethiopia there is a direct relationship between agriculture production and nutritional status. Studies examining the relationship between seasonality and malnutrition in Ethiopia have demonstrated the correlation between nutritional status and household food consumption. One study in Sidamo and Southern Shoa regions showed nutritional status to be lower during the land preparation and planting months of January through June, with the lowest rates occurring in March (Kumar et al). From July to December nutritional status improved, reaching a peak in October during the main maize harvest.

This study and others also demonstrated that it is the poorer households that endure the greatest seasonal stress. In addition to planting their own fields, they often work extra hours for other households to earn supplemental food or cash. Poorer households are also unlikely to be able to hire labor to work on their farms. With increased income levels farmers are often able to hire additional labor and thus reduce the level of nutritional stress within their households through reduced labor expenditure and increased production.

The effect of seasonality on women varies somewhat depending on agro-ecological zone. For example, for women in onset growing regions, weight loss is moderate throughout the year, but not enough to alter physical activity or health. This may be attributed to the fact that women's agricultural labor is more evenly distributed through the year in the region, with a modest peak during onset harvest (Ferro-Luzzi et al, 1990). In addition, there may be more foods produced and available with overlapping crop sets maturing throughout the year in onset growing areas.

Food-based Approaches to Micronutrient Deficiencies

Food-based approaches offer sustainable solutions to nutritional problems. Food-based approaches include production, acquisition, preservation, and use of food. The goal of a food-based approach is to increase the effectiveness of foods or diets in providing key nutrients. This approach creates links with both agriculture, and the private food sector as well. Agricultural and policy interventions, such as improvement of agricultural feeder roads and market liberalization increase income and also increase the ability of people to purchase fortified foods (e.g. the ubiquitous Blue Band margarine in Kenya—fortified with vitamin A and iron). Further, agricultural policies that encourage research into and actual implementation of crop diversification strategies and use of drought resistant crops work to not only increase access to micronutrients but also decrease the likelihood of total crop failure and household level famine. Genetic research into creation of staple crops with enhanced ability to extract micronutrients from the soil (e.g. iron, zinc) is presenting agricultural extension agents with promising interventions which will have a direct effect on the nutritional status of farmers and urban dwellers dependent on unprocessed purchased foods.

Behavior Change and Education

Many misconceptions about proper breastfeeding and young child feeding practices exist in Ethiopia. Although foods may be available to meet nutritional needs as noted above (Meskel and Kassa 1996), there does not seem to be the knowledge necessary for adequate preparation and feeding. In addition, overburdened mothers and poverty conditions may be contributing to lowering young child nutritional status.

The key to each of these infant feeding issues appears to be education. Again, it has been found repeatedly that agricultural and food policy interventions, such as improved agricultural feeder roads, dramatically improved attendance by mothers at antenatal clinics and nutrition and health classes and workshops (USAID/1995). UNICEF courses for young mothers are of no use if those targeted cannot attend due to bad roads and lack of transportation. If education cannot be offered within the communities, consideration must be given to the logistics of mothers reaching courses, as well as clinics located outside of their villages.

Education about the increased nutritional needs of pregnant and lactating women is noted as important to increased child survival. For example, foods considered "good" for pregnant women in Ethiopia include eggs, cabbage,¹⁰ teff, and meat. Other foods are considered taboo like roots and millet which are believed to prevent the production of blood and make both the mother and child thin. In some regions, foods such as eggs, milk, and butter are believed to make the head of the child grow large and cause problems during delivery.

In addition to access to resources and food, the work burden placed on women may negatively impact nutritional status. Pregnant women, as noted above, are not excluded from farm labor and other duties, and thus become especially vulnerable. Many have a difficult time gaining sufficient weight to maintain their nutritional status and health and that of their babies. Sixteen percent of Ethiopian babies are born

¹⁰ Especially problematic given that many members of the cabbage family inhibit uptake of any iodine consumed.

with low birthweight (UNICEF 1997) Prenatal care is considered inadequate in Ethiopia, and quite often pregnant women have to walk great distances to clinics and hospitals for services Relative to other developing countries the maternal mortality rate (1,400 per 100,000 births) is alarmingly high (UNICEF 1997)

In order to facilitate the implementation of the UN Convention of the Rights of the Child, a national committee of governmental and non-governmental organizations was established in 1991 As part of the ICN Summit's Year 2000 goal to eliminate vitamin A deficiency, a national VAD control program is being implemented through the Ethiopian Nutrition Institute (ENI) The program package consists of wide-spread sensitization of VAD, vitamin A capsule (VAC) distribution, nutrition education, and promotion of horticulture production, with VAC distribution being the central focus

PVOs are being asked to assist the Government of Ethiopia line Ministries with implementing the latter's programs, which are sometimes in variance with the priorities and plans of the PVO and the needs of the local people Donor agencies typically go through lengthy processes with government ministries to develop programs in collaboration Information gaps exist, e g the possibility for wide-scale food fortification is largely unknown, and probably unlikely However there may be some potential for fortifying sugar, particularly in the metropolitan areas There is a need to capitalize on the important medium of radio to communicate information about nutrition and the role of micronutrients in health For example, from the 1995 MICS, only 21 percent of the households surveyed ever had heard a message about Vitamin A Additionally, there is a question of adequate preparedness planning for drought and ability to mitigate of its nutritional consequences, without substantial donor inputs

Food Aid

Over the past four years the nutritional status of children in food-assisted maternal and child health (MCH) programs has improved (USAID/CDIE 1997) It is believed (although not documented) that food rations contributed indirectly to nutritional improvements by motivating mothers to attend MCH activities (counseling, growth monitoring, and nutrition and health education) (ibid) Food aid is currently being used as a condition for policy dialogue on issues critical to achieving food security, it is also being used as a vehicle to support economic growth strategies and public resource transfers that selectively benefit lower income target groups (USAID/CDIE 1997)

B Acute Food Insecurity—Refugees, Disasters, and Nutrition

It is clear that the numerous refugee crises in the GHA are a result of two key factors conflict and drought Indeed some argue that at the heart of most conflicts in the region is drought and other issues related to access to natural resources Those areas with greater access to the resources of water and fertile soils are also those areas facing political instability and conflict

Drought

Drought decreases the availability of already scarce resources Those households lacking the mechanisms to weather repeated crop failures or livestock losses are those who become refugees It is clear from the literature that refugees are produced by repeated failures of rains and crops, and not simply a product of a single year of drought Most households have multiple income and production avenues and as such have

developed mechanisms to see them through the normal cycles of periodic drought. In Ethiopia, it is noted that restrictions on movements of people between regions has limited the number of refugees produced directly by drought-induced famine.

Households become refugees only as a last resort. Webb, von Braun, and Johannes (1992) note that those households affected by drought progress through a series of stages as the drought continues to linger. As noted, most rural households maintain in normal years mechanisms to cope with small-scale, periodic shortages. For example, most households maintain not only a high diversity of crops, many drought resistant, but they also maintain multiple sources of cash income. However, these mechanisms can only go so far and soon farmers are faced with having to deplete savings, sell household and productive assets (plows, livestock, etc.), and sell their labor. As the situation worsens food is rationed (reduced portions and number of meals) and famine foods are utilized (wild foods, various cultivated roots [cassava], and tubers). If a community is lucky, they will be targeted for distribution of relief supplies or food for work programs.

Conflict

Unlike situations of drought, nutritional emergencies brought about by conflict often come up suddenly. Overnight, households are deprived of productive assets, livestock, crops, and other food stores as well as the opportunity to return to their livelihoods. It is estimated that during the war with Eritrea, 65,000 to 95,000 tons (Webb et al 1992: 62) of food production was lost due to destruction, inability to plant, or theft. Conscription drives reduced the number of men available for agricultural labor, and the labor shortages were filled instead by the women of the household. Webb et al (1992) also note the increased burden of war-related taxes for those households not directly in harm's way. Conflict is noted to also reduce government spending on agricultural and marketing infrastructure—further increasing food insecurity.

V OVERVIEW AND CONCLUSION

There are two guiding principles to the regional activities and initiatives of REDSO/ESA/PH: 1) building African capacity to promote improved household level nutrition and child survival interventions, and 2) expanding the use of lessons learned, especially of those "better practices" used throughout the region that improve nutritional status through an improvement of food security situations. To these ends, this paper has presented an overview of the food security and nutrition situations in Ethiopia and a review of the critical links between these sectors.

Ethiopia is experiencing high levels of stunting of children, especially those living in rural areas. Several regions are experiencing high levels of wasting. Micronutrient deficiencies are noted as vitamin A, iodine, and to a lesser extent, iron. Malnutrition is a significant problem for both stable and refugee populations.

The food security situation in Ethiopia is characterized by declining per capita production and by a need for increased liberalization of the agricultural market systems. However, it was clearly noted that there is considerable variation within Ethiopia depending upon agro-climatic characteristics.

The key areas requiring intervention are education, income generation, agricultural production, and marketing. Specific interventions have been discussed, however, it is expected that these discussions have

acted merely as a catalyst for discussion and "brainstorming" among the African partners participating in the GHAI meeting in Asmara on food security and nutrition linkages. It is expected that our African partners, in collaboration with USAID and NGOs, officially will be able to use this document to facilitate the creation of interventions informed not only by the on-site experience of the African partners but by the prior research detailed herein.

** Interventions to address the problems identified in this Case Study on Ethiopia have been proposed by the Cooperating Agencies of LINKAGES, OMNI, BASIS, and QAP. They may be found in the document - Priority Interventions Linking Food Security and Nutrition, April 1998.