A REVIEW OF THE STATE OF FOOD AND NUTRITION IN TANZANIA AND ITS PROGRAMMING IMPLICATIONS

APRIL 1986

PREPARED FOR USAID/TANZANIA BY:

JUDY BRYSON, CONSULTANT, TEAM COORDINATOR
NANCY METCALF, REDSO/RFFPO
ANN SHRIVER, USAID/T AG. ECONOMIST
JOEL STRAUSS, USAID/T FOOD MONITOR
DR. FESTO KAVISHE, TFNC MEDICAL NUTRITIONIST
ANNA PETIT, ARUSHA REGIONAL NUTRITION OFFICER

Notice

This report was commissioned by the U.S. Agency for International Development, to provide information and recommendations on the food and nutrition situation in Tanzania. The report was prepared by an independent review team and submitted to the USAID Mission to Tanzania. The conclusions and recommendations contained in the report therefore do not necessarily reflect the opinions, policies, or program plans of the U.S. Government. The report will be reviewed by both Mission and AID/Washington. It will certainly be one of many factors that enter into the decision making process for U.S. humanitarian assistance activities in Tanzania.

Table of Contents

EXECUTIVE SUMMARY

1.0 PURPOSE OF THE REVIEW

The purpose of the review was (a) to study the food and nutrition situation in Tanzania to identify the magnitude and causality of undernutrition problems, especially those of young children, and in chronic food deficit, drought prone areas; (b) to develop information on the interventions which are addressing these problems, and especially those using food aid; and (c) to suggest a strategy for enhancing the effectiveness of such interventions.

2.0 PRINCIPAL FINDINGS

2.1 Food and Nutrition Situation

Tanzania is not a food deficit country. In 1983/84, the year of the food emergency, the country's production was 780,000 tons above the level required to provide an adequate diet for its population. In 1984/85 production was 1.73 million tons above the required level. However, Tanzania has major problems of child undernutrition and food insecurity. These are linked to food maldistribution on three levels: intra-family, intra-community and inter-area. Existing village organization and local government structures are being mobilized in a few cases to address the causes of child undernutrition and food insecurity. Policy reforms such as improved price incentives, changes in marketing structure, and trade liberalization are contributing also to the solution of these problems.

2.2 Child Undernutrition

The prevalence of severe forms of child undernutrition (below 60% of the Harvard Standard weight for age) is four to six percent and of moderate forms (below 80%) is 40-60% of the under-five population. This translates to 180,000-260,000 severely malnourished children and 1.8-2.6 million moderately malnourished children out of a child population of 4.4 million.

2.2.1 Geographic Pattern

Despite considerable differences in production levels between various areas of the country, child undernutrition rates do not vary a great deal. There was no strong correlation between food production in a region and moderate rates of child undernutrition. However, food surplus areas frequently have high rates of undernutrition while some food deficit areas have low rates.

2.2.2 Causes

The review process was facilitated by the use of a conceptual model developed by the Tanzania Food and Nutrition Center (TFNC) and UNICEF. The model explicitly identifies several levels of causes which result in undernutrition and hunger. These are divided into immediate causes, underlying causes and basic causes. The immediate causes of undernutrition are inadequate intake and utilization of nutrients, and disease. In Tanzania, inadequate intake of nutrients is not correlated with low levels of food production.

TFNC and UNICEF identified two underlying causes: the low energy density of the typical weaning food (uji , a thin porridge made of grain flour) and the low frequency of feeding. Children receive only a limited number of calories from the volume of uji which they can consume in a single feeding. The low frequency of feeding presents a serious problem in this context. Children need to be fed four or more times a day for adequate nutrition. However, in some areas they are fed between once and twice a day and the overall average is between two to three times per day. Cereals deficit areas of Tanzania where malnutrition rates are somewhat lower are those where milk consumption is higher. This relationship may be due to the higher energy density of fresh milk and ease of consumption.

The low frequency of feeding appears to derive from a number of factors, the most important being the workload of the mother in food production. Further problems are limited and distant supplies of fuel wood and water which are the responsibility of women to collect. The heavy workload of women is another underlying cause of undernutrition in children because pregnant women are frequently underweight and experience low weight gain during pregnancy. This results in low birth weight babies which is directly correlated with later undernutrition.

2.2.3 Effectiveness of Exisitng Food Aid Program in Addressing Child Undernutrition

Existing interventions supported with food aid are ineffective in addressing these problems. The programs primarily operate out of Maternal/Child Health (MCH) clinics which serve 1000-2000 mothers monthly drawn from a wide area. The food aid commodities (bulgur wheat, milk powder and oil) are given to the mother which may assist in her control over them. However, the mother and child need much greater volumes of food as well as support from the family or community in meeting the competing demands of childcare and the mother's other responsibilities. Education given at the clinics is focused on

the mother and does not create this wider support.

Although the program could be improved by establishing village-based activities (as Catholic Relief Services (CRS) is doing already in some areas) the food aided activities have other important drawbacks. In particular, the cost is prohibitively high if anything other than a small fraction of the need is to be met. It costs US$57 per child per annum to provide the ration supplied by CRS at its MCH clinics. The cost of procuring the commodities in the United States and transporting them to Tanzania is $29. The remaining $28 is borne by the recipients and covers internal handling, administration and clinic activities. These costs are at least 60% in foreign exchange as a major share of the expenses are incurred in relation to transportation. Other problems experienced are delays and non-arrivals of commodities which disrupt programs, and the difficulty of controlling high value commodities in short supply. Finally supply of food aid tends to distract communities from seeking solutions to their child undernutrition problems through interventions employing local resources.

2.2.4 Other Interventions

The review identified several other intervention programs which appear promising in addressing child undernutrition problems. These programs are village-based and include the following components:

a. sensitization of households and village leadership to undernutrition problems through child nutrition surveys and educational programs;

b. training and/or support for village health personnel;

c. growth surveillance systems and child registers;

d. promotion of improved weaning foods; and

e. establishment of nutrition rehabilitation and maintenance systems within villages.

The costs of the programs are substantially lower than the food aided interventions and are primarily local currency costs. The staff of the Joint Nutrition Support Program (JNSP) in Iringa Region (one of the interventions visited by the review team) estimates that the services it is providing can be introduced into an area for the local currency equivalent of approximately $10 per annum per child served and $5 for expansion of a program. Even if these estimates fail to allow

for certain hidden costs the orders of magnitude indicate they are considerably less expensive than the food distribution approach.

2.3 Food Insecurity in Drought Prone Areas

The review team developed an agricultural production/consumption systems typology to assist in differentiating between the causes and types of malnutirition problems in the various areas of the country. This typology indicates that the areas where food production tends to be below consumption requirements are pastoralist areas (population .5 million) and where the millet/sorghum/livestock production system is found (population 3.3 million). Pastoralist areas take a substantial portion of their consumption from animal products and are able to purchase grain for consumption through animal sales in normal times. Although other areas suffer nutritional and food insecurity problems (especially the cassava area -- population 3.3 million), the problems of the millet/sorghum/livestock system are the most severe.

2.3.1 Response to the 1984/85 Food Emergency

Numerous donors responded to the request of the Government of Tanzania (GOT) for emergency assistance in 1984. The largest response involving food distributions to affected households was that of CRS utilizing commodities from the Public Law 480 (PL 480) allocation of the United States Government (supplied through the Agency for International Development -- USAID). CRS also received a grant from the US government to cover certain expenses, mainly transport of commodities. Further assistance came from the sale of oil supplied from PL 480 stocks, with the local currency generated helping to cover the costs of the emergency distributions. The total cost to the US government was $14 million (not including USAID staff time and other costs), and CRS incurred additional costs also.

The review of the emergency response concluded:

a. The various responses did alleviate suffering and save lives.

b. Almost all programs were begun too late and delay in the arrival of emergency food aid caused further program setbacks.

c. A more cost-effective future response to droughts affecting limited areas would include developing local resources and mechanisms to mobilize food produced in

Tanzania's food surplus regions.

d. Only in cases of severe drought should imported food aid be used to respond to food emergencies.

2.3.2 Interventions Addressing Food Insecurity

At present there is no comprehensive plan to address food insecurity problems either on a day to day basis, or in the event of a food emergency. The GOT, regional and local governments, and various donors have underway interventions intended to address various aspects of the problems. These interventions include regulations requiring farmers to plant minimum acreages of drought resistant sorghum, afforestation campaigns to improve the environment for agriculture, and measures to improve the operations of the grain markets. Enhancing the effectiveness of all these measures, and establishing agreed procedures to address food emergencies, offers the possibility of a more efficient response to the problems of these areas both in terms of cost and results.

Programs could include:

a. development of markets and processing techniques for drought resistant crops;

b. farm and village level storage;

c. support to cooperatives in purchasing and storage of crops at the district level; and

d. assistance in the transportation of grain from food surplus to food deficit areas.

3.0 RECOMMENDATIONS

3.1 Child Undernutrition

Food aid for direct distribution to households should not be increased and should be phased out gradually in agreement with the local organizations involved in the programs. It should be replaced with resources to support government bodies and NGOs who wish to carry out programs which include the components identified in 2.2.4 above.

3.2 Food Insecurity In Drought Prone Areas

Two steps should be taken to address the problems of these areas:

a. A comprehensive plan should be prepared for measures

to reduce the frequency and severity of food emergencies, and to establish specific procedures to use in managing food emergencies when they do occur.

b. A fund should be established to serve as a support mechanism for the areas, and provide the means to implement the plan. Government bodies and private organizations could apply to the fund for support of activities to ameliorate conditions in the areas. It should also serve as the funding source for measures to implement the previously agreed procedures in food emergency situations.

1.0 INTRODUCTION

1.1 Purpose

The purpose of the review was (a) to study the food and nutrition situation in Tanzania to identify the magnitude and causality of undernutrition problems, especially those of young children, and in chronic food short, drought prone areas; (b) to develop information on the interventions which are addressing these problems, especially those using food aid, and (c) to suggest a strategy for enhancing the effectiveness of such interventions.

1.2 Approach Taken to the Review Process

A conceptual model developed by the Tanzanian Food and Nutrition Center (TFNC) and UNICEF facilitated the review. This model approaches the problems of undernutrition from a multi-sectoral, multi-causal scientific basis. A full description of the model can be found in TFNC Report No 988 of February 1986, "Conceptual Approach in Defining the Problem of Hunger and Under-Nutrition", by Dr. Festo P. Kavishe and Dr. Urban Jonsson. An diagram of the conceptual framework is in Annex 1.

The model explicitly identifies the several levels of causes which result in undernutrition and hunger. These are divided into immediate, underlying and basic causes. Actions to address immediate causes are rehabilitative in nature and cannot be sustained because the processes responsible for the problem continue to operate. An understanding of this concept helps to explain why well intentioned responses may have limited results.

The review was carried out between February 18 and March 14, 1986 following several months of pre-planning and data collection. The team reviewed data available from a variety of organizations, government departments, and existing studies. Interviews and field visits supplemented the information available from these sources. The review team visited five regions, Arusha, Kilimanjaro, Shinyanga, Dodoma and Iringa, from February 23 through March 5 1986. The regions were chosen to provide a cross-section of the agro-climatic zones in Tanzania. Personnel at various levels of government involved with food and nutrition programs and the staff of non-governmental organizations (NGOs) were contacted. Discussions with these field personnel provided additional information and local perspectives on the issues. A variety of intervention programs were visited to develop an overview of existing activities and to establish, if possible, which types

of interventions were working best and why. A listing of the individuals and programs visited is in Annex 2. The analysis and recommendations developed by this process are presented in the following sections of the report.

1.3 Overview of the Report

Section 2.0 of the report contains an analysis of the food and nutrition situation in Tanzania. As will be seen, Tanzania does not appear to be a food deficit country. Production of 5,470,000 tons of food per annum would be sufficient to provide an average consumption of 600 grams of food per day per person (estimated 1985 population 21,475,500) and an additional 100 grams per person per day to cover seed, feed, waste and milling losses. During the 1983-84 agricultural year the Food and Ariculture Organization (FAO) estimated a total production of 6,250,000 tons. That was the year of the food emergency in certain areas of Tanzania. FAO estimates 1984-85 total food production at 7.2 million tons.

Despite these levels of production Tanzania has a serious problem of child undernutrition and there are chronically food-short areas of the country which tend to experience food emergencies when the weather is especially adverse. Section 2.0 discusses the magnitude and causality of these problems.

Section 3.0 describes Nutrition and Food Strategy policy and programs currently operating in the country. Section 4.0 discusses the problem areas in current food aid use which were identified in the review. Section 5.0 presents suggestions for a future approach to interventions addressing the problems of child undernutrition, and of food deficit/drought prone areas. Section 6.0 contains the conclusions of the review.

2.0 FOOD AND NUTRITION SITUATION ANALYSIS

The first task of the review was to establish an information base on the food and nutrition situation in Tanzania with particular reference to the problems of child undernutrition and chronic food deficit drought prone areas. Section 2.1 below presents a typology of the food production/consumption systems in Tanzania. In Section 2.2 the typology is used as a basis for presenting information on the amounts and types of food available in the various production areas, as well as data on other factors relevant to consumption. An overview of child nutrition status is provided in Section 2.3 which discusses available data and studies in further detail and considers other factors which appear to play a role in child undernutrition. Section 2.4 discusses the problems of the food deficit drought prone areas using a simplified version of the production/consumption systems typology. A summary and conclusions arising from the analysis are provided in Section 2.5.

2.1 Objective and Conceptual Framework

The food production and consumption situation in various areas of Tanzania is described in this section in an attempt to differentiate between the causes and types of malnutrition problems in these areas. In order to carry out the analysis, a typology of areas was developed and certain criteria chosen to assess and compare areas.

2.1.1 An Agricultural Production/Consumption Systems Typology

Since we are attempting to analyze causes and effects of malnutrition, our typology is based upon both agricultural production and consumption factors which characterize various systems found in Tanzania. It therefore differs somewhat from the agroecological zones which have been put forward by agricultural research in its combination of both agroeconomic and nutritional perspectives.

Tanzania's production/consumption systems do not match neatly with its administrative divisions and agro-climatic zones. Unfortunately, such data as is available covering the whole of the country is usually aggregated over regions, large administrative areas which often contain several distinct systems. Great care has been taken in using the regional level data to describe the production/consumption systems we have identified, combining several fields of expertise with many years of experience in the country in interpreting it. Furthermore, some areas (such as Morogoro) do not fit into

distinct systems and can be said to include so many disparate systems existing side by side that they defy classification under the typology developed by the review. Conclusions about small subsectors within these miscellaneous mixed farming systems can be drawn to the extent that these resemble the larger systems which are described below.

Below is a listing of the production/consumption systems chosen and the areas in which these systems are found. The population estimates are drawn from district level projections for 1985 made by the Early Warning Unit of the Ministry of Agriculture. They are therefore useful only as rough estimators of the magnitude of populations falling within the systems.

System	Locations	Estimated Population
1. Coffee/Banana	Moshi, Hai, Rombo districts, Kilimanjaro Region	883,081
	Bukoba, Karagwe and Biharamulo Districts, Kagera Region	870,511
	Parts of Arumeru district, Arusha Region	413,155
	Rungwe (Tukuyu) District, Mbeya Region	649,463
	TOTAL	2,816,210
2. Pastoralist	Kiteto, Monduli and Ngorongoro Districts, scattered pastoral areas in Hanang and Mbulu Districts, Arusha Region, parts of Singida, Dodoma, and Tanga Regions	
	TOTAL (Approx)	500,000
3. Sorghum/Millet/ Livestock	Dodoma Region	1,236,390
	Shinyanga, Bariadi, Maswa Districts, Shinyanga Region	1,312,593
	Musoma/Bunda and half of Tarime Districts, Mara Region (Lowlands)	759,794
	TOTAL	3,308,777
4. Cassava	Mtwara Region	981,752
	Kilwa & Lindi Districts Lindi Region	491,204

	Mwanza Region		1,835,978
	Parts of Rukwa		*
	Parts of Ruvuma		*
		TOTAL	3,308,934
5. Maize Surplus	Njombe/Makete and Iringa Districts, Iringa Region,		859,328
	Chunya, Mbozi, Ileje, Kyela Districts, Mbeya Region		649,463
	Rukwa Region		574,813
	Ruvuma Region		714,323
	Mbulu and Hanang Districts, Arusha Region		537,840
	Kahama District, Shinyanga Region		370,943
	Half of Tarime District, Mara Region		160,915
		TOTAL	3,867,625
6. Urban Areas	Dar es Salaam		
	Other towns	TOTAL	2,963,619**

* Populations included under Maize surplus system, which is predominant.
** 13.8% of 1985 estimated population (population from 1978 census).

The typology above accounts for roughly ulation. The remaining 5 million people live primari ions (Tanga, Morogoro, Coast) or on the Island of Za y mentioned, these areas are such heterogeneous mixt tems that it was not possible for the team to classify them.

2.1.2 Factors Relating to Nutritional Status

In addition to devising a set of categories, the review team identified a set of factors that can be compared across systems and that affect the general availability of food in an area and the ability of area residents to acquire the food. In the past, production levels for staple crops have been used as indicators of the need for food aid, since it was assumed that malnutrition would be more prevalent in areas where food production was lower. It will become clear in the following presentation that this seemingly logical assumption is in some ways incorrect. Information on production is essential in designing a response to drought-induced general shortages of food which are primarily short-term in nature. This was the approach used in reaching decisions concerning the USAID reaction to the 1983/84 "drought" which affected areas in Shinyanga, Mwanza, Singida, Kilimanjaro, Tanga, Tabora, Mara, Arusha and Dodoma. Information on factors other than

production are required, however, to design programs which attack the underlying causes of child malnutrition and similarly to develop approaches to solving the problems of the chronic food deficit areas.

The method of this exercise was to describe production, consumption, income, and staple price conditions in each of the systems identified above, in order to see whether any of these factors bore any strong relationship to levels of child malnutrition or revealed other distinct types of nutritional problems. Due to the limited time available for the review, we were unable to collect our own data and therefore used data already compiled by various sources. In most cases this information was not available in aggregations matching the typology of systems we chose. We have therefore used the data from certain representation areas to support our general descriptions. Our analytical technique is extremely simple and informal, since the frailty of the data will not bear the weight of more complex modeling. The data, with a discussion of their weaknesses and strengths, are presented in Annex 3 to the report. In order to compare the areas under discussion, we have ranked them as high, moderate, or low with respect to a particular indicator. More precision would mislead the reader into placing more confidence in the data than they deserve. It is our purpose to create a general impression of the situation faced by the consumer in each system rather than to rigorously define and classify populations.

The assessment considered these factors:

1. Production: Total staple production in the region, as estimated by the Early Warning Unit, was reduced for feed, seed, waste and milling losses, and divided by the population to yield staple production per capita per day for the last two crop years. This gave the amount of staple food available before food was marketed in or out of the region. When this is weighed against the FAO-established minimum of 600 grams per person per day (when production figures have been reduced to accommodate losses), the region can be characterized as either staple food "surplus" or "deficit". In addition, district food balances are supplied where the system being described is pertinent to some districts of the region and not others. These are available only for 1984/85, which was in general a very good harvest.

2. Consumption: Using 1976-77 household budget survey data, we have ranked the staples consumed and compared consumption of energy dense foods (meat and milk) between regions, classifying it as relatively "high", "moderate"

or "low". Milk was chosen specifically because it seems to bear a relationship to levels of malnutrition.

3. Income: Household budget survey data were again used to compare between regions the average levels of both cash and non-cash income per household. This gives a picture of the balance between dependence on subsistence production and purchased foods. Absolute levels are reported only in the appendix; since the data were collected in 1976 these will not be meaningful today. Instead, a rank ordering is presented here for inter-regional comparisons, with one being highest and 20 being lowest.

4. Price Variability: Over the last three years, monthly maize prices in town markets collected by Marketing Development Bureau (MDB) were graphed and variabilities observed. This variability affects both food consumers' and producers' welfare, since in Tanzania these groups almost completely overlap (except for a small group of non-producing urban consumers). Graphs and standard deviations are presented in Annex 3; here price variability is merely described as "high" or "low".

5. Malnutrition: The only data available consistently nationwide on levels of malnutrition among children under 5 are collected by Government MCH clinics and hospitals. The team found upon reviewing these data that they are significant underestimations of the actual levels of malnutrition in the population due to the way in which the data are collected (see below for more discussion on usefulness of MCH data). Therefore we have used survey data for representative areas where available from various sources, some of which are summarized in the UNICEF "Analysis of the Situation of Children and Women". A table is presented in Annex 3, while the team's assessment of their relative levels (high, moderate or low) is presented in this section.

The results of the analysis are contained in Section 2.2 below. The various production systems are discussed in separate Sections each of which begins with identification of the regions chosen to represent the system. Thereafter production figures are provided in terms of grams per capita per day after reducing for losses, and information on consumption items. Income data indicate the rankings of the regions (one is top, 20 bottom for cash and non-cash income). The data presentation concludes with the rankings of crop price variability and malnutrition levels experienced in the region. "NA" indicates that data were not available on the factor or region. In each

case the data presentations are supplemented by a narrative discussion to assist in data interpretation. Much of the information contained in the narratives was collected in discussions with local government and NGO personnel during the team visits to the representative areas.

2.2 Assessment of Production/Consumption Systems

2.2.1 Coffee/Banana

Regions:	Kilimanjaro	Kagera
Regional Production:	83-4: 806 84-5: 746	83-4: 693 84-5: 723
District Production, 84/85:	Rombo: 826 Moshi: 539 Hai: 1,247	Bukoba: 963 Karagwe: 1,505
Consumption:	Staples: 1. Bananas 2. Maize Milk: High Meat: V. High	Staples: 1. Bananas 2. Sweet Potatoes Milk: Low Meat: Moderate
Income:	Cash rank: 3 Non-cash: 4	Cash rank: 4 Non-cash: 12
Price Variability:	High	NA
Malnutrition:	High	High

These areas are characterized by high average cash incomes which conceal a high disparity between very wealthy coffee plantation owners and very poor people with no access to productive land. Kilimanjaro especially is characterized by a severe land shortage; parcels are split up into smaller and smaller pieces as they are divided among the sons as inheritance. Although these areas produce approximately enough or more than enough food for self sufficiency, a high proportion of this is cooking bananas, which have a low protein content when compared to grains. Nurses at the Kilimanjaro Christian Medical Center nutrition rehabilitation unit said that malnutrition was a serious problem affecting large proportions of the population of certain villages, where they occasionally found families who had not eaten for several days. Periodic drought has not been a problem, as rainfall is high (over 1000 mm. per year) in the banana producing areas. It

should be noted that although the regional aggregates cover districts which contain different systems such as Same district in Kilimanjaro Region, the majority of the population of these regions falls within the coffee/banana systems and the data are generally representative of this fact.

2.2.2 Pastoralist

Regions:	Arusha
Regional Production:	83-4: 410 84-5: 447
District Production, 84/85	Monduli & Ngorongoro: 53
Consumption:	Staple: 1. Maize, plus milk in Pastoralist areas Milk: Very High Meat: Moderate
Income:	Cash rank: 10 Non-cash: 8
Price Variability:	Very High
Malnutrition:	Relatively High in Mbulu and Hanang (maize surplus), Low in Ngorongoro, Kiteto, and Monduli (pastoralist).

In this case, special note must be taken when using regional data because Arusha encompasses two quite distinct systems: pastoralists in the Ngorongoro, Monduli, and part of Kiteto districts and settled maize/wheat surplus producers in Mbulu and Hanang. Staple production per capita is much higher than the region-wide average shown above in Mbulu and Hanang, and much lower in the pastoral districts as demonstrated by the district food balances shown. The high milk consumption occurs primarily among the pastoral groups, for whom it has traditionally functioned as a staple food. Grain consumption, however, is rising in pastoralist areas as consumption patterns change (see section 2.4). Monduli district authorities informed us that the annual grain requirement for the district was 15,000 metric tons while production stood at around 2,000 tons. This system can therefore be described as staple food deficit/importing, and is very likely to remain so for the foreseeable future. District authorities assured us that 90% of Monduli's population could afford to purchase the grain they need, as they have an adequate cash income from the sale of

their cattle. However the National Milling Corporation (NMC), Tanzania's grain marketing parastatal, provides very little grain to the area and private market prices are high and variable.

In this system, the price variability factor is relatively important in determining consumer welfare because of the high degree of dependency on purchasing grain imported from surplus areas. Improved marketing and transport systems, beef cattle development, and increasing yields in the very limited fertile areas were mentioned as priorities in discussions at Monduli. The most interesting and perhaps surprising aspect of this system, however, is that regional medical officers, district medical officers, and the staff of the Maasai Health Project all maintained that moderate malnutrition rates among children were relatively low (many quoted the figure 30%) when compared with the neighboring maize surplus areas. Many of the health professionals postulate that the high consumption of fresh milk, which is high in calories and easily consumed, may explain the phenomenon.

2.2.3 Sorghum/Millet/Livestock

Regions:	Dodoma	Shinyanga
Regional Production:	83-4: 165 84-5: 175	83-4: 834 84-5: 1275*
District Production, 84/85:	All districts included	Shinyanga U+R: 543 Bariadi: 690
Consumption:	Staples: 1.Sorghum 2. Maize Milk: Moderate-High Meat: Moderate	Staples: 1. Maize 2. Sorghum 3. Sweet Potatoes Milk: High Meat: Moderate
Income:	Cash rank: 20 Non-cash: 10	Cash rank: 14 Non-cash: 9
Price Variability:	Moderate-High	Moderate-High
Malnutrition:	Moderate	Moderate

* This high level is primarily due to extraordinarily high estimates for Maswa and Kahama districts which seem to be of questionable accuracy.

In these regions, nearly the entire area falls within the system under discussion, with the exception of Kahama and some parts of Lariadi in Shinyanga region and northeast Kondoa in Dodoma Region. Average rainfall in Dodoma is under 600 mm, while Shinyanga receives less than 800. These areas could be classified as semi-arid as well as drought prone. Dodoma particularly is consistently in a food deficit position, with Dodoma Rural district being perhaps the least productive on average. Yet the grain marketing cooperatives have purchased over 12,000 metric tons of grain from Dodoma region this year, primarily from Kondoa and Mpwapwa, indicating that food moves out of the region through the official marketing channels, rather than between neighboring districts, even though these neighboring rural districts are extremely short of food.

Food aid in one form or another has been provided to the region since the early 1970's by the Tanzanian Government, and there is a very strong prevailing belief among government officials that the residents have become dependent upon food aid and for this reason fail to plant enough food. Officials claimed that because they had conducted a "campaign" to convince the peasants to produce more over the last two years, they were no longer asking for food aid every year. It is perhaps not coincidental that Catholic Relief Services (CRS) increased its infusion of food assistance to the region substantially during these same years, although production was not significantly lower than normal. It is significant that these two areas displayed some of the lowest average cash incomes in the country in 1976-77, and it is unlikely that this ranking has changed in the intervening decade. Of further interest is the fact revealed by the household budget survey that Dodoma had the highest proportion of the country's two lowest income groups. The likelihood is that Dodoma region as a whole, like the pastoralist systems to the north, will continue to need to import food through open market channels at the same time that some districts are exporting food through official channels.

Although Shinyanga has been categorized together with Dodoma there are certain important differences. In the aggregate the region produces more food and most years, most of the districts are self sufficient in food. Kahama district actually falls within the Maize surplus system described below and accounts for a good proportion of the large regional surplus indicated in the 84-5 production data above. Small pockets of chronically food short areas, however, are developing in some of the eastern and southeastern wards of Shinyanga Rural district and southern Maswa district, where rainfall is lower and desertification due to overgrazing is intensifying. Note that although Shinyanga District had a "very good" harvest in

1984-85, it was nevertheless in a food deficit position. Some migration from Shinyanga is occurring, according to Regional officials, in response to the diminishing carrying capacity of the land. During the food "emergency" of 1984-85, malnutrition rates at some of the clinics rose, but in most cases remained below the levels found in Iringa which is a food surplus area. This paradox is discussed further in Section 2.2.5.

2.2.4 Cassava

Regions:	Mtwara	Mwanza	Lindi
Regional Production:	83-4: 984 84-5: 1101	83-5: 726 84-5: 805	83-4: 1177 84-5: 920
District Production 1984/85:	All districts included	All districts included	Kilwa: 1694 Lindi: 791
Consumption:	Staples: 1. Cassava 2. Maize Milk: Low Meat: Moderate	Staples: 1. Maize 2. Cassava 3. Sweet Potatoes Milk: High Meat: Low	Staples: 1. Maize 2. Cassava Milk: Low Meat: Low
Income:	Cash rank: 16 Non-cash: 9	Cash rank: 9 Non-cash: 15	Cash rank18 Non Cash:16
Price Variability:	NA	High	NA
Malnutrition:	High	Moderate	Moderate

Cassava is grown and consumed as an important staple in Rukwa and Ruvuma, as well as in the above listed areas. It is drought resistant and grown in pockets of these regions which will not support maize, and as a hedge against a bad year in the areas where maize can be grown. Both maize and cassava are important in the diet of all of these places; when rainfall is low people fall back on the less preferred cassava to tide them over until the next harvest. The major difference within this system is that the protein dense foods are scarce in Mtwara and Lindi, while livestock are raised in Mwanza, providing milk and meat products. Mtwara and Lindi are also physically isolated during the rainy season, which exacerbates marketing problems. It is perhaps this isolation which contributes to some very

high malnutrition rates which were observed in the Makonde Plateau by the USAID food monitor in June 1985 (some 80% of children were reportedly moderately malnourished), since the difficulty of addressing localized droughts and flooding is increased by transport and communications problems.

2.2.5 Maize Surplus

Regions:	Iringa	Rukwa	Ruvuma	Mbeya
Regional Production:	83-4:1064 84-5: 874	83-4:1136 84-5:1286	83-4:1336 84-5:1172	83-4:736 84-5:772
District Production 1984/85:	Njombe/ Makete: 958 Iringa: 803	All districts included	All districts included	Chunya: 869 Ileje: 988 Kyela: 1008 Mbozi: 691
Consumption:	Staples: 1. Maize	Staples: 1. Maize 2. Sorghum 3. Cassava	Staples: 1. Maize 2. Cassava	Staples: 1. Maize
Income:	Cash rank:17 Non-cash: 7	Cash rank:8 Non-cash: 2	Cash rank:13 Non-cash: 6	Cash rank:11 Non-cash: 11
Price Variability:	Moderate	Moderate	Low	NA
Malnutrition:	High	NA	NA	Moderate

No survey data is available on malnutrition in the maize surplus producing areas of Rukwa and Ruvuma, and that for Mbeya is outdated. However, there is a great quantity of reliable information coming out of the Joint Nutrition Support Program (JNSP) in Iringa (described in 3.3.3 below), which can be considered representative of the general trend in the maize surplus systems. Rates of moderate malnutrition are consistently in the higher part of the 40-60% range, and it is noted in the studies connected with the project that malnutrition rates are highest in the most productive villages.

In general, rainfall in the "big four" is over 1000 mm per annum, with large tracts of undeveloped land receiving rainfall in the 800-1000 mm range. Rainfall patterns are also highly reliable and population densities relatively low. Cultivated hectarage per person ranges around .30, compared to .03 in

Monduli, .12 in Moshi, and .22 in Dodoma District. Maize market prices follow the normal seasonal patterns, rising in the pre-harvest period and falling after harvest. Fluctuations are much less erratic than those experienced in Shinyanga, Arusha, and other northern towns. Maize is both a subsistence and a cash crop. It became a highly profitable cash crop in recent years due to market price increases. It would not be surprising to learn that the cash income ranks of these regions had risen since the data quoted above was collected.

The surpluses grown in the "big four" supply the rest of the country with food in two ways. NMC purchases maize at official producer prices from the regional cooperative union (prior to this year, it bought directly from farmers). It then transports this maize from these regions to its sales points, primarily in Dar es Salaam. During purchasing years 1981-82, 1982-83, 1983/84 NMC bought respectively 87%, 93%, and 85% of its maize from these four regions (77,400, 64,000, and 73,000 metric tons in total).

Unofficial grain trade also occurs. The Marketing Development Bureau has estimated that roughly 80% of domestically producted grain sold in Tanzania moves through private marketing channels. The Government has not encouraged this trade, yet chronic rural deficit areas depend on it, and it continues to occur.

An unknown amount of food is illegally exported from Tanzania to neighboring Zambia, Kenya, and Rwanda. Lack of consumer goods has encouraged this trade. No estimates are available on the volume of the trade due to the sensivity of the issue, but it seems to increase when drought strikes neighboring countries. Chances are that food prevented from moving internally, either by high cost or government regulation, will find its way out of the country. This phenomenon, if clearly measured and understood, could significantly change our perception of Tanzania's "surplus" food positon. After accounting for non-food uses, waste, and milling losses, Tanzania produced an estimated 6,024,138 tons of edible food in 1984/85. If 22% of this total was exported, Tanzania would merely break even on the food consumption/production balance (assuming a need for 600 grams of edible food per person per day, Tanzania's minimum requirement for 1985 was 4,703,135 metric tons).

2.2.6 Urban Areas

Regions:	**Dar es Salaam**
Production:	**83-4: 418 (combined with Coast Region)** **84-5: 198**
Consumption:	**Staples: 1. Maize 2. Rice** **Milk: Low** **Meat: High**
Income:	**Cash rank: 1** **Non-cash: 2**
Malnutrition:	**Low**

The above data, with the exception of production per capita, refers to Dar es Salaam city alone. Production in the surrounding Coast region tends to flow to the city, but as illustrated above is entirely inadequate. The NMC therefore sells over half of it's total 300,000-400,000 metric tons of preferred grains annually in the city at subsidized prices (while the explicit subsidy was dropped in 1984, official prices still remain far below market prices for grains in Dar), although the city contains only 7% of the nations populace. Feeding Dar es Salaam will remain a high priority of the Tanzanian government for the foreseeable future, and this priority will continue to be reflected in the official marketing systems for food. Rural areas which require food imports from other areas in the country are therefore left primarily to their own devices, and rely heavily on the private grain markets which exist throughout the country.

2.2.7 Mixed Farming Areas

Large areas of some regions of Tanzania are occupied by farmers who migrated into the area and have adopted such mixed farming and consumption patterns that they defy classification under our system. These areas include Coast, Tanga, and Morogoro regions. A large variety of crops including fruits and vegetables is grown and a great deal of rice, both imported and locally grown, is consumed. Malnutrition rates in these areas, when data is available, seem to reflect the general national pattern of 40-60% of children moderately malnourished.

2.3 Overview of Child Nutrition Status

2.3.1 Relationships between Growth, Health and Mortality

Well nourished children in all countries of the world follow a similar growth pattern up to the age of 5. From birth onwards they increase in body mass, stature, weight and they develop motor and intellectual skills. Children who do not eat enough food (either due to low intakes or due to raised requirements as in illness) will not develop to their full potential.

Malnourished children have a higher risk of mortality and they are less able to cope with disease. They suffer prolonged illnesses and will become more malnourished as a result. Diarrhea, malaria and the immunicable diseases in particular have a detrimental effect on children's nutritional status.

2.3.2 Available Data on Nutritional Status

An estimated 40 - 60% of the children under five years of age are moderately malnourished. Severely malnourished children form 4 - 6% of the under fives. The total under five population is around 4.4 million children. This means that 1.8 - 2.6 million children are moderately malnourished and 180,000 - 260,000 are severely malnourished (UNICEF and GOT, 1985).

These figures are based on a number of surveys done since independence in various areas of Tanzania, most of which have been summarized in the 1985 Analysis of the Situation of Children and Women by UNICEF. A table taken from the report is included in Annex 4. No national surveys on nutritional status have been carried out to date, and therefore our conclusions are based primarily on those survey results over smaller areas.

Three surveys were carried out among the pastoral and non pastoral communities of Arusha Region in 1983 by the regional nutrition office. These showed prevalences of 30% moderate malnutrition for the Maasai pastoralists and 35% for the predominantly agricultural inhabitants of a village in Mbulu district.

In all the surveys listed above nutritional status is defined by weight as a percentage of expected weight for age. The cutoff point for classifying children as underweight or malnourished is 80% of the median of the international reference (Harvard or ICNHS/WHO).

Although the MCH data often do not reflect the rates of

malnutrition found in surveys, analysis of the trends in the data over the years produces some interesting patterns for further study. When looking at the Regional MCH-returns for 1980-84, one can rank the data. Consistently the worst six include Iringa, Kagera and Arusha and at least one of the Morogoro/Tanga/Coast group and Dodoma or Singida. Arusha data here represent only the non-pastoralist systems, as coverage in the pastoralist area is very low. Iringa and Arusha (non-pastoral) are surplus areas for cereal. Kagera is surplus for bananas. In most districts there seem to be higher levels around August/September and December/January/February but these level changes are not large enough to be significant.

Children are regularly weighed in all Tanzanian MCH clinics. Data are collected and sent to district/regional levels and finally to the MCH Unit in the Ministry of Health on a monthly basis. Levels of malnutrition reported by MCH clinics are generally much lower than those reported from surveys for various reasons. The MCH population is a self-selected sample, comprising mainly the children of immunicable age (0-12 months) who are not generally malnourished. Older children visiting the clinic often come because of illness and may not be weighed. As usage of MCH services is probably highest within shorter distances of the clinic, there is also a geographical bias reflecting a disproportionate prevalence of higher income families. Finally, coverage varies widely between areas; anywhere between 10% and 80% of children in a given area may attend. Data reported by CRS-MCH clinics are closer to the survey-figures i.e. in the 40-60% range. This may be because the food distribution attracts a larger and possibly more malnourished segment of the population.

2.3.3 Relationships between Nutritional Status and Agricultural or Economic Performance

Nutritional status seems to be related to income level in urban settings, (Bantje and Mgaza, 1980), and has been seen to be correlated to educational status of the mother, which may be a proxy indicator for better access to services and economic status. However, various other studies indicate that economic improvement, at least at village level, does not automatically lead to improved nutritional status. For example, in Njombe district in 1975 malnutrition levels in the purely subsistence section of the survey population were lower than in those areas where production for cash income was increasing (Jacobsen, 1978). In the Iringa nutrition survey (TFNC, 1981), rates of malnutrition were found to be higher in villages with a high crop production. A more recent study done by Concern (a voluntary agency) confirms this observation. On the whole, malnutrition in Iringa, which is a large surplus area seems to

be higher than in areas where staple food availability is lower.

The apparent contradictions found in Iringa, that malnutrition rates are higher in the more productive villages is an illustration of the theory that general food availability in the area is not the primary determinant of child nutrition. In fact cash income levels seem to be negatively correlated with the proportion of underweight children in some cases. Considerable informaion is available on the subject as a result of the activities of the Joint Nutrition Support Program (JNSP). JNSP staff speculate that as areas develop and labor becomes a constraint to increased production and income, women's labor becomes more valuable to the family in the field than in the household, leading to an allocation of women's time to activites which prevent them from feeding children frequently. Yet the family's increased cash income is fungible in a way that the subsistence production of the past was not, and can be used toward purchase of consumer goods, improved educational activities for older children, and increased consumption of alcohol.

This analysis may be describing the problems of a transitional phase of the local economy from pure subsistence to a partly cash, partly subsistence base. This is taking place at a disruptively accelerated pace due to the increase in profitability of maize production over the last several years. As education and access to services catches up with rising cash income levels, better management of household resources will result. Although the conjecture of JNSP personnel about the underlying causes is largely speculative and untested, their observation of the final effect on child weight for age seems likely to be quite accurate. Observed feeding frequencies are low and weaning foods are of low energy density, leading to high rates of moderate malnutrition in the presence of an agricultural surplus.

2.3.4 Immediate and Underlying Causes for Undernutrition

The immediate causes of malnutrition in Tanzania have been described as insufficient food intake and disease. Underlying causes are a low frequency of feeding and a bulky diet of low energy density. The overall quality of the diet is sufficient if eaten in large enough quantities to satisfy energy requirements. Due to the heavy workload of women and the amount of work required to prepare food (e.g. fetching of water and firewood) often only one or two meals are consumed: a small one in the morning, if any, and a heavy one in the afternoon.

It is not possible for a small child to eat enough at one or

two meals to satisfy energy requirements for the day. The problem is made worse by the bulky nature of the staple consumed. A typical gruel given to a child can contain up to 95% water, resulting in an energy density of approximately 50 calories per 250 mililiter cup. A healthy child can consume 1 1/2 cups per meal (75 - 100 calories). Even if a one year old child were given thicker porridge or "ugali" like the adults, and this child could manage to consume a 300 gram portion, energy intake would not be more than 250 - 300 calories per portion. The energy requirements for a one year old healthy child are 1,000 calories per day. To satisfy this requirement, the child would have to consume 4 large portions of stiff porridge or up to 10 cups of watery gruel.

Breastfeeding can provide up to 500 or 600 calories per day so that energy adequacy is more easily reached by breastfed children. The riskiest periods are after breastfeeding stops and before the child is able to handle large enough portions of adult food. When energy requirements are met, protein intake is usually adequate. Since the majority of diets are mixed, energy deficiency is the major nutritional problem. Increasing energy density and increasing frequency of feeding are necessary to meet the child's requirements and to sustain growth.

Disease will often prevent adequate nutrition even if a child can eat enough of the available food to satisfy the body's requirements. An ill child has little appetite and prefers liquid, soft foods. Many diseases (e.g. diarrhea, measles) increase requirements through increased nutrient loss and higher metabolism. A diarrheal disease attack frequency of 2 to 3 per year and a duration of 3 days per attack can have a profound impact on nutritional status. Diarrhea attacks the child in the difficult period of transition from pure breastfeeding to a more varied diet. At the age breastfeeding often stops completely the child is increasingly exposed to diseases like measles and malaria. If nutritional status is already marginal, malnutrition can easily be the result.

The heavy workload of women has a further relationship to undernutrition in children in that pregnant women are also found to be underweight and to experience low weight gain during pregnancy. This results in low birthweight babies which is directly correlated with later undernutrition.

When looking at underlying and basic causes of malnutrition one must take into consideration that even at the village level access to resources is inequal. As will be seen in section 2.4 during the 1984 drought those at the top of the economic ladder profited while those in the middle and at the bottom suffered

hardship as income distribution became less equitable.

2.4 Food Deficit/Drought Prone Areas

The description of food deficit/drought prone areas roughly follows the production/consumption system typology outlined in section 2.1.1, but is simplified somewhat by using three basic categories: primarily pastoral, mixed farming, and primarily agricultural. Before examining each of these categories, a few introductory remarks are appropriate.

It is difficult, even dangerous, to generalize too freely about food deficit/drought prone areas. The word "areas" is used intentionally, for they do not correlate to administrative regions or even the smaller districts. There are seven major rain zones in Tanzania (Gommes and Housiau, 1982) with innumerable variations. During the 1984/85 emergency (see section 3.4), Kondoa District of Dodoma Region was labeled a drought affected area. However, while the southwest section (sorghum-millet) suffered about 80% crop failure, the north-east maize zone (100 miles away) recorded bumper harvests. The "drought prone" Mara Region encompasses an area in Tarime District called the Kurya Highlands which almost always produce a surplus.

Areas within the following regions can generally be considered food deficit/drought prone: Mara, Mwanza, Shinyanga, Kigoma, Tabora, Singida, Arusha, Kilimanjaro, Tanga, Dodoma and Mtwara. All of these, except Mtwara, are located in the northern half of the country.

Food deficit/drought areas receive less than 1,000 mm annual rainfall. Indeed some areas receive only about 200 mm. However, total annual rainfall is much less important than timing. Because so little rain can be expected in any given year, it must fall in the right amounts at the right time. For example, during the 1983/84 "drought year", Maswa District got only 17% less total rainfall than in an "average year". However, the government estimated that total crop production in the district fell 75% below the 1983/84 target. The problem was poor distribution of rain over time rather than a decreased total amount for the season.

Pastoral

Pastoralists are found in areas of Arusha, Kilimanjaro, Singida, and Tanga Regions. (As pastoralists are by definition semi-nomadic, they can also be found in other areas of the country but the above four regions are "home" areas.) Pastoral areas are characterized by scattered, low-density population

(the three pastoral districts in Arusha Region have 2-4 persons per square kilometer), a cattle/person ratio of approximately five to one, and very poor roads which become impassable during the rains. Their livestock consists of cattle, goats, sheep and donkeys - almost none keep poultry. They do not cultivate grain; however, they are consuming increasing amounts of grain. A 1981 study by Kaj Arnhem of villages in Ngorongoro District of Arusha Region contains a table which illustrates the current importance of grain consumption especially in the dry season.

Percent of Daily Diet by Season

	Dry	Wet
Meat	6	4
Milk	30	82
Grain	64	14

A further illustrative statement in the Arnhem study is that 70% of all income generated by livestock sales goes to purchase grain. (Kaj Arnhem: "A Pastoral Food System", 1981.) Groups in other areas are even more grain dependent.

In normal years, the system of selling livestock to buy grain works well. However, the pastoralists come under heavy stress in years of drought. Cattle prices to fall and grain prices rise. During normal times the value of a mature animal is about equal to that of six 90 kg bags of grain. During the height of the 1984/85 emergency, one cow could purchase only one bag of grain. Besides stock reductions due to sales, animals die. In 1984/85 some families lost 50% of their herd, particularly hard hit were lactating females and calves. Whereas many agriculturalists and mixed farmers can recover from effects of a drought after one year if the rains are sufficient, pastoralists require several years to rebuild their stock. In addition to these problems, an upsurge of East Coast Fever, for which vaccine is in short supply, has further reduced livestock levels.

Mixed Farmers

Mixed farming is practiced in all drought prone areas of northern Tanzania (listed in paragraph 2 above). An important factor in determining the nutritional status of mixed farming families, brought out in previous sections, is the number and distribution of cattle among these households. The census of 1978 stated that 44.7% of the households in Shinyanga Region (total population 1.2 million) owned "some" cattle, in numbers ranging from one to 1,000. In a 1984 OXFAM survey, the average

number of animals per cattle-owning household was 17 head. A very small proportion have herds of 100 head or more.

During normal years, the mixed farming system functions in the following manner: households cultivate grain or root crops as a subsistence crop, in some areas cotton is grown as a cash crop, and livestock are used as an additional food and income resource. In addition, cattle function as a traditional method of storing resources between seasons, rather like a savings account. In times of drought, subsistence crops partially or totally fail. Families cultivating cash crops use their cash savings and then begin to sell their livestock to buy grain. As in the pastoral areas, grain prices rise while livestock prices fall.

During the 1984 drought, cattle sales at the Shinyanga cattle auction more than tripled over the previous year's level. According to a village-by-village survey conducted during the drought in Kishapu Division of Shinyanga Rural District, most mixed farmers with 10 or fewer head of animals sold off all their stock. Those with 20 - 40 head suffered sizable stock reduction. Those few families with large herds actually increased the total numbers by buying up animals that their neighbors were selling. The overall animal population changed very little. Whereas before the drought in Ngofila village, Shinyanga Rural District, about 40% of the households owned cattle, after the drought only 15% owned any cattle and 5% owned most of the cattle. (Estimates of the village chairman, June 1985.) Furthermore, draft oxen were in a weakened condition and could not be used for extensive field preparation immediately after the drought.

Those families without livestock go to work for wealthier farmers and therefore spend less time working their own farms (several village chairmen in Maswa District, Shinyanga Region estimated that 80% of the households engaged in casual labor in 1984/85). Even if the rains are good, these families may not harvest enough to insure an adequate food supply while the wealthier farmers increase their total grain production as a result of the plentiful supply of cheap labor. Yet without the wealthy farmers, many families would not survive a drought. (Looked at from a certain perspective, this is an indigenous form of food-for-work.)

The net result of a drought in mixed-farming areas is that those at the top of the economic spectrum are likely to profit, those in the middle suffer hardship, and those at the bottom are marginalized and sustain extreme nutritional stress.

Agricultural

One predominantly agricultural food deficit/drought prone area where very few households own livestock - although many keep poultry - is the southern region of Mtwara. Cassava is the main staple with some sorghum cultivation. Farmers bordering the Ruvuma River also grow maize and rice which are used both as food and cash crops. Other cash crops are groundnuts and cashews, although cashew production has greatly decreased in recent years due to disease and historically low farm-gate prices. Some fishing is done on the coast and along the Ruvuma.

In times of drought, medium and small agriculturalists are in the worst position to cope as they have few income resources to convert to food, with the exception of large cash crop farmers. Thus the short-term impact of the infrequent severe droughts in Mtwara is greater than in pastoral or mixed farming areas.

Overview

Periodic drought is a fact-of-life in Tanzania. In the last 25 years, droughts have occured in 1961/62, 1974/75 and 1983/84. While some areas in eleven regions are drought prone, nearly all these regions include also highly productive sections where crop failure almost never occurs. Several other regions usually produce large surpluses, so that the country taken as a whole cannot be considered drought prone. With seven major rain zones, it seems highly unlikely that Tanzania will experience a total crop failure. Intra- and inter-regional food commodity transfers, if properly managed, could do much to alleviate the worst affects of drought in all but the most unusual of years. Due to the poor transport infrastructure and the NMC directive to sell primarily to urban centers, the in-country transfer process was not fully utilized during the 1984/85 food emergency and had very little impact (see section 3.4). However, recent government policy reforms and program innovations as outlined in Section 3.1 could have a significant impact on food deficit/drought prone areas by the time the next drought takes place.

2.5 Summary and Conclusions

The most important conclusion drawn by the team from the above assessment is that there is no clearly demonstrated relationship between the proportion of children who are moderately malnourished in an area and the ability of that area to produce a surplus of grain. This leads us to rethink the concept that additional food supplies are necessarily required in food "deficit" areas if children are to be better nourished.

It tends also to make us wary of a heavy dependence upon rates of child malnutrition as a measure or indicator of food shortages or "emergencies".

It is difficult to escape the conclusion that food problems in Tanzania are of a distributional nature rather than a question of absolute levels of production. Several distinct types of maldistribution exist. The one which causes high levels of moderate child malnutrition is primarily a question of intra-family distribution and the lack of awareness of the importance of frequent and calorie-dense feedings. Only in unusual cases is child undernutrition truly the result of an overall lack of resources to address the problem in the area.

The second type is maldistribution of resources, goods and services within communities. This type of maldistribution is one of the underlying causes of severe malnutrition and infant mortality, and exacerbates the effects of drought in food deficit areas. In the coffee/banana areas of Kilimanjaro, severe malnutrition is the result of poverty at least partially attributable to lack of access to productive land. Rukwa, one of the "big four" maize surplus regions, has the highest infant mortality rate in Tanzania at 171 deaths per 1,000 live births. Rukwa has one of the least developed health/MCH services in the country. Finally, section 2.4 above illustrates how maldistribution of resources causes severe hardship to those at the lower end of the economic spectrum during times of drought.

The third category of maldistribution problems illustrated in this chapter is that which arises between food surplus and deficit areas, and the nature of this problem differs between areas. In some, increased food production and village and farm level storage would counterbalance the periodic localized crop failures which result in soaring prices and nutritional stress. In others, where there is little potential for increased food crop production (pastoral areas, Dodoma Rural district), private and/or official grain markets must become more efficient in serving the areas.

3.0 NUTRITION AND FOOD STRATEGY POLICY AND PROGRAMS

The second task of the review was to develop information on the responses to the food and nutrition situation in Tanzania. Various aspects were covered: government policy, the administrative structure, and existing activities addressing food and nutrition problems. A summary presentation covering these subjects is provided in the following section of the paper. There are many facets of these topics and numerous activities underway. The discussion here attempts to cover the more significant policies and activities, though with respect to the latter there is no exhaustive treatment of all the activities or all the organizations involved in Tanzania. The conclusions of the review team concerning the existing responses to the food and nutrition situation are given in Section 3.5.

3.1 Policy Environment and Administration

3.1.1 The National Agricultural Policy

The National Agricultural Policy prepared in 1982 and presented in March 1983 is geared towards agriculturally-led economic growth and has as its objectives:

a. the development of an egalitarian community based agriculture in line with the policy of socialism and self reliance;

b. the achievement of self-sufficiency in food and raising the nutritional standards of the population;

c. raising the standard of living of the people; and

d. raising the proportion of monetary agriculture.

The policy addresses both food and cash crops and livestock and covers political considerations, infrastructural and supportive services, production organization, marketing, incentives and resource deployment, and strategies for implementation. Recommendations are also made on individual major food staples production based on seven agroclimatic areas, each with a specific growing pattern. This recommendation is further elaborated in the National Food Strategy where crops suitable for each specific zone are recommended, with emphasis on sorghum in the drought prone areas. By-laws exist in each area mandating the area individual farmers must allocate to certain crops such as sorghum or millet. However, economic factors often motivate farmers to allocate resources differently, and

it is difficult or impossible to enforce the by-laws. For example, farmers in Shinyanga often plant maize due to its high return and a change in consumer preference away from the traditional drought resistant staples. During the occasional drought year, these farmers lose their crops and are forced to sell cattle to obtain food.

Although all land in Tanzania belongs to the Government, the granting of legally binding titles of land ownership on a 33 year lease period was recommended in order to increase the willingness of farmers to invest in improved technology. In the village, three forms of agricultural production exist. These are the homestead, the block farm and the collective farm (village government farms). Homestead farms vary in size depending on the availability of land, family labor and other inputs. Here the farmer can grow crops of his choice (limited by the by-laws) and the proceeds belong to the family. The block farm is a large area of land subdivided into small holdings which are allocated to individual families resident in the village. The production pattern in the block farm is planned by the village governments. Again, the proceeds from this farm accrue to individual families. The collective (communal) farm is a village government farm where every able-bodied resident is required to work. The management of the farm is directed by the village government and part of the proceeds are shared out among the workers, while some are retained by the village government to finance village development projects. The types of food crops grown in all the three types of farms are now dictated by the by-laws mentioned above.

On the whole the success of the above types of farm organizations vary from village to village, depending on the quality of village leadership. Individually-owned farms have yielded better results than collective village farms while a few collective farms have shown good results. The purpose of the collective and block-farming systems is to provide a starting point for the introduction of modern production techniques including mechanization. Shortages of foreign exchange have limited the ability of the government to supply the tools necessary to achieve this goal.

The National Agricultural Policy also provides for the existence of large parastatal farms and foreign and locally-owned commercial scale farms. On the whole, the performance of parastatal farms has been poor enough that former President Nyerere recommended that the less successful of these be turned back over to private ownership. This process has tentatively begun as local businessmen and foreign investors such as Lonhro investigate the possibilities with the

Tanzanian Government.

An important emphasis of the Policy is the use of the ox plough to substitute for human labor thus making it possible to expand production. Actions to implement the policy are underway. However, the ox plough is not appropriate for all areas of Tanzania. Planting larger tracts of land will also create increased labor requirements at other points in the crop cycle which are likely to fall most heavily on women, thus further increasing their workload. A less problematic aspect of the Policy is the afforestation campaign to preserve the environment for agriculture. Implementation of the policy in Dodoma resulted in the successful rehabilitation of thousands of acres. Similar efforts are underway or planned in other drought prone areas such as Shinyanga and the former maize basket area of Ismani in Iringa.

3.1.2 Pricing and Marketing Policy

Agricultural pricing and marketing policy is part of the National Agricultural Policy. This section of the Policy includes increased producer prices, encouragement of lateral trading among newly re-established co-operative societies and unions, liberal distribution to retail outlets in the villages, and relieving the National Milling Corporation (NMC) of its reponsibility as the exclusive official marketer of commercial food crops.

These pricing and marketing policy actions are intended to improve producer incentives in the face of a high inflation rate, to use prices effectively as an instrument for guiding the composition of agricultural output, and take into account the impact of transport costs in order to encourage food movement from areas of surplus to deficit areas across regions. In this respect, road blocks which had been established to check food movements were abolished. Consumer price subsidies on preferred staples had, over time, increased the burden on the government budget and tended to bias consumption and agricultural improvement efforts towards preferred staples. For example, the World Bank financed National Maize Project was implemented in several regions including drought prone areas where maize cultivation is often wasted labor, and subsidies made maize flour cheaper than the grain itself. These consumer subsidies have since been removed.

Although the implementation of changes in agricultural pricing and marketing began only recently, evidence that the policy is having a positive impact is provided by this year's record food crop sales to co-operatives. For example by February 1986, Iringa Cooperative Union had bought 47,000 tons of maize as

compared to average annual sale to NMC of 20,000 tons over the 1975-1980 period, and 24,600 tons in 1981-85. This can partially be attributed to significant increases in the official prices of food crops in 1984, bringing them into line with market prices in the surplus areas.

Although there are other possible contributing factors to such record sales, the establishment of the coops and the liberal pricing and marketing policies pursued must have had a significant impact. Co-operatives are nearer to the farmers than NMC and therefore potentially more responsive to their needs. Lateral trading between co-operatives at all levels is permitted and provisions have been made for co-operatives to sell their collections to other parastatal and private organizations. External sales are envisioned when national food self-sufficiency is surpassed, and cooperatives can keep fifty per cent of their foreign exchange earnings for purchase of imported inputs. As the co-operatives are less than a year old it is difficult to predict the extent to which some of these provisions will be implemented.

3.1.3 Food Strategy

In 1980, an FAO preparatory mission assisted the Government in the formulation of a comprehensive Food Strategy, its final formulation coming out at about the same time as the Agricultural Policy. The National Food Strategy aims at increasing the country's capability of meeting expanding food needs from domestic resources in the most economically efficient manner possible. It also lays out a strategy for achieving greater security against short term fluctuations in domestically produced food supplies. The objective of the National Food Strategy is food self-sufficiency, which is compatible with the goals of the Agricultural Policy.

Apart from emphasizing major components of the Agricultural Policy, the strategy specifically deals with the question of food crop storage from the household to the national level, and the establishment of a strategic grain reserve. Although the strategic grain reserve has been emphasized mainly at the national level, a need has been expressed from several quarters to revive the former British system of village based strategic grain reserves.

3.1.4 External Trade Liberalization

The economic problems which have gripped Tanzania since the oil crisis of 1973 are mainly structural in nature and have been caused and maintained by a combination of external shocks and internal policies. It is important to note, however, that the

economic crisis manifested itself at the grass root level as a lack of consumer goods and deteriorating social services. Many peasants responded to the crisis by withdrawing from the official market into subsistence and unofficial marketing.

Tanzania responded to the decline in its export earnings by structural adjustments in both infrastructure and policy. Trade liberalization has resulted in increased availability of consumer goods which are necessary incentives for production. The liberalization includes the deregulation of some food crops such as oilseeds and provision for foreign exchange retention by exporters of some products.

3.1.5 The Food and Nutrition Policy

This policy was finalized in 1980 but has not yet been adopted. However, several components have already been implemented through other policies. It is expected that the Food and Nutrition Policy will be adopted by the Tanzanian Government later this year. The major objective of the Food and Nutrition Policy is the reduction of malnutrition in all age groups. It includes recommendations for dealing with the various causes of malnutrition at the immediate, underlying and basic cause levels, and recognizes the need for a multisectoral approach to interventions.

The Food and Nutrition Policy also recommends the coordination of all projects related to food and nutrition. It specifically stresses the need for external agencies dealing with food and nutrition to involve the Government through relevant ministries in the planning, implementation and evaluation of their projects. Such coordination will assist in monitoring the flow of food aid to the country since at present it is almost impossible to get reliable statistics on total food aid. It will also help to show who is doing what and where, so that efforts in combating malnutrition will be complimentary rather than competitive. In the final analysis it will prepare relevant government sectors to take over the running of donor supported projects once external support is curtailed.

3.1.6 Government Structure and the Importance of District/Village Level Government in Policy Implementation

The government structure is based on 20 regions in mainland Tanzania and five in Zanzibar. The regions are divided into a maximum of eight districts each; the current total of districts is 106. This number will increase as larger districts are allowed to sub-divide and towns are accorded district status. The role of district level government has recently increased in

importance as a result of the Local Government Act which re-established district councils. The act also provided a revenue base for districts through the provision for a development levy, and small scale trade licensing.

Below the district level there are divisions (of which there are approximately 360 in the country), and Wards (about 1900) which are of more operational importance than the divisions. Below wards there are villages, an average of six to eight per ward, though there are wide variations in the number depending on village size. There are approximately 8500 villages in Tanzania. The village is run by a village government whose five committees cover both social and economic aspects. Recently village governments have been allowed to pass by-laws to establish a sixth committee on health and nutrition. The village is the foundation of the government structure. Villages are divided into ten household units which are represented on the village council by an elected leader. The ten cell units are the foundation of the administrative and Party structure.

Earlier government policies tended to "deconcentrate" government but retained a major decision-making role for the central government. The more recent approach allows for "decentralized" decision-making and execution. The parallel structure of party, administration and technical support in Tanzania results in a complicated implementation process. This is exemplified by the formal health service infrastructure which is diagrammed in Annex 5 to the report.

It will be seen from the health service infrastructure that health is only one of the several technical sectors in the Government administrative structure. The district is the highest level at which health programs are implemented, and all vertical progams are completely integrated at the ward (dispensary) level. This means that the organization of Primary Health Care starts to become ideal at the ward (dispensary) level. The village level below the dispensary, however, is considered to be the most suitable focus for nutrition interventions.

3.2 Programs Addressing Child Undernutrition

3.2.1 Maternal and Child Health (MCH)

MCH services provide a package of preventive and curative activities that are especially targeted towards mothers and children. These services include ante-natal, peri-natal, post-natal, family planning, immunization, growth monitoring, health and nutrition education and minor curative services for

both women and children under five years of age. These services are provided under one roof at the dispensary level.

The MCH program started in 1974 under its present form and expanded rapidly thereafter. For example, in 1978, it was found that 53 per cent of deliveries took place in a health institution. The comparable figure for 1984 was 60 per cent. Also in 1984, about 75% of children had a growth chart, and 46% were weighed at birth. The immunization coverage which tended to decline in the 1978-82 period, despite substantial investment in terms of vaccines, vehicles, cold chain, etc., has shown an increase since 1984 as the cold chain reached the district level (see section 3.2.5).

One activity which MCH clinics have often performed is the distribution of food aid. In the past four years, many clinics have distributed dried skimmed milk, oil, and sometimes donated cereals either channelled through the Ministry of Health or other government and non-government organizations like CRS. When food aid supplies were late, or failed to arrive, and when the allocation to a clinic was stopped, the result was disruption of clinic activities due to the disappointment of the mothers and falling attendance. The benefit of the food aid to the targeted group which is normally malnourished children (under 80 per cent of weight for age) has not been documented.

The MCH progam addresses the immediate causes of malnutrition. Only to a lesser extent does MCH attack underlying causes. Their quantitative and qualitative expansion especially in the promotive and preventive aspects would greatly facilitate the prevention of malnutrition.

3.2.2 Primary Health Care (PHC)

The Ministry of Health issued "Guidelines for the Implementation of PHC" in October 1983, which endorsed the eight minimum components of the global PHC strategy: health education, promotion of food supply and proper nutrition, safe water supply and basic sanitation, MCH services including family planning, immunization, prevention and control of locally endemic diseases, appropriate treatment of common diseases and injuries, and the provision of essential drugs.

It is paradoxical that while the framework for the sound development of PHC in Tanzania is laid down in the PHC guidelines as embracing several components including MCH, Expanded Program of Immunization (EPI), and Essential Drugs Program (EDP), the PHC unit in the Ministry of Health has been given the status of a unit alongside its essential components.

In many regions and districts, PHC has been equated to the training and development of Village Health Workers (VHW). This anomaly is in the process of correction by the Ministry of Health.

Most of the requirements of PHC were provided for in the period 1970-78. The major thrust has been towards the establishment of simpler and smaller health care units, as close as possible to the people. Preventive activities by short-term trained staff are carried out at these units. By 1985, 16 out of the 20 regions of mainland Tanzania had been incorporated in the VHWs training program, and 8 regions had trained a total of more than 500 VHWs. The objective is to train 1000-1500 VHWs annually so that by the end of the year 2000, there would be two VHWs (one male, one female) in each of the nearly 9,000 villages. Although VHWs have been doing a good job, several village governments have been unable to remunerate them and some drop outs have been recorded. In view of the land area covered by some villages and also to ease the work load of VHWs and replenish drop outs, certain areas (e.g. the Maasai Health Project in Arusha) have trained more than two VHWs per village, and in Mvumi (Dodoma), and Hanang (Arusha) another cadre called Village Health Promotors (VHP) or Village Health Leaders (VHL), who are in charge of subsections of the village, have been tried.

Because of the extensive countrywide political and administrative organization in Tanzania an excellent platform exists for mobilizing people's participation in all economic and social activities including PHC and nutrition awareness. It would seem desirable, therefore, that the local infrastructure should be used more and more in implementing the PHC strategy. Specific malnutrition interventions like the use of Kimea (germinated cereal flour described below) in reducing the food bulk of starchy staples could be popularized through this channel as well. This would enable the people themselves to maintain continued vigilance over their health and nutrition, and initiate and sustain efforts to overcome related problems. Towards this end, action could include seminars, meetings, and workshops involving the Government and the Party leadership at administrative levels where there is command of resources (eg village, ward, district, region).

3.2.3 Expanded Program for Immunization (EPI)

Communicable diseases are one of the two immediate causes of malnutrition. Since the majority of these diseases are immunizable, immunization is a very important component of PHC in Tanzania. Immunization is integrated in the MCH clinics although there are sporadic mobile immunization teams mainly

operated by church missions and sometimes by the Government in special situations such as epidemics or during health campaigns in villages in underserved areas.

The immunization coverage differs from region to region. A 1984 evaluation showed that on average 53% of the children in the well served areas (Iringa, Morogoro, Arusha) were fully immunized, while the corresponding figure for the underserved areas (Lindi, Rukwa, Shinyanga) was only 16 per cent.

Over the last few years, the EPI program was verticalized, and donor support was available for a heavy investment in an efficient cold chain system. The system reached all districts by 1984. Since then extension of an efficient cold chain into the Rural Health Centres (RHCs) and dispensaries was started and a notable success in increasing immunization coverage has been observed.

Unfortunately, at the dispensary level where the majority of vaccinations are carried out, there are still problems of transport, kerosene, supervision and vaccine supply. Since most of the rest of the immunization system is more or less in place, from vaccine purchase through accessible health centres and dispensaries with willing and able staff down to parental co-operation, the EPI coverage could surge forward to reach targets if these problems were solved. A new strategic impetus to address these problems has been developed with donor support and aims at universal immunization coverage by 1988. However, it should be realized that the weakest links are oil related and for Tanzania, the global oil crisis of 1973 has remained a permanent one. Continued scarce resource allocation will therefore depend on the level of priority that decision makers accord this program in the face of other crucial economic priorities.

3.3 Donor Programs Supporting Child Nutrition Interventions

3.3.1 Catholic Relief Services

Catholic Relief Services (CRS) is the major cooperating sponsor for U.S. food aid to Tanzania. It has operated in the country since 1962. CRS's program consists of MCH feeding, pre-school feeding, general relief, institutional feeding and food-for-work. Tonnages through the end of the 1970's were usually between 5,000 and 6,000 tons and never exceeded 7,000 tons. At one time CRS was operating 931 centers in 16 of the 20 mainland regions. A 1980 AID Audit Report stated that the CRS program was unmanageable and should either be reduced in size or shut down altogether. Over the next several years, CRS cut back to eight regions and programmed food levels fell to

about 4,500 tons.

MCH feeding comprises about 80% of the CRS regular program. MCH programs are of two types: clinic-based and village-based. Clinics are either government or church (not always Catholic) operated and usually service several villages. This is normal in Tanzania, but the clientele tends to come from a larger area when CRS offers food rations along with other clinic services. The five kilo (kg) ration package consists of 2 kg bulgur wheat, 2 kg milk powder an 1 kg cooking oil. The normal recipient contribution per ration received is TShs 30. By government regulation, only children under 80% weight-for-age may be enrolled in the feeding program. However, once enrolled, a child is eligible for monthly rations until the age of five. Also younger siblings can automatically enroll in the feeding program. It is quite common to find a family receiving a three ration package totalling 15 kg for the mother and two children under five. The food ration is the first component of the CRS MCH activities. CRS views the ration as an economic transfer to the family which is intended to assist the family in providing a better diet for the child. This objective is also promoted by the other components of the program, especially growth monitoring and nutrition education. The growth monitoring system is an essential component as it is the means of assessing whether the commodities and education provided are achieving the desired results in terms of a satisfactory nutrition status for the child. The weights are recorded on a chart at each monthly clinic visit. The chart serves as a record of each child's growth and information on immunizations and illnesses are also recorded on it. It serves also as an educaional tool for the mother as it demonstrates how her child is progressing. Other services are provided at the clinics in some cases such as referral to dispensaries or hospitals for treatment of disease and immunizations.

CRS village-based MCH programs are a variation of the clinic-based program. The MCH center serves only one village and all children under five and their mothers are eligible for a 5 kg ration package. In addition to growth surveillance and health education, home visit follow-ups are part of the program. Another feature of the village-based program is the associated development activities. After program costs are deducted from recipient contributions, the balance of money is to go into village planned activities which might take the form of vegetable gardens, animal husbandry, tree planting, improved village water supply, food processing (grinding mills or oil presses) or crop storage. This component was just getting off the ground when the 1984 drought struck and attention had to be shifted to the emergency program (see section 3.4). Little progress has been made regarding associated development

activities in the ensuing two years.

The fiscal year (FY) 1986 CRS program consists of 4,534 tons for 74,800 recipients. However, CRS plans to institute a Family Food Security program in 1987 with food aid as possibly, but not necessarily, one component. This program will operate initally in only three regions with chronic food deficits - Shinyanga, Singida, and Dodoma. The CRS food programs in other regions will be phased out. The FY 1987 Annual Estimate of Requirements (AER) is expected to be for approximately 2,000 tons of commodities.

3.3.2 Overview of Other Non-Governmental Organization (NGO) Programs

There are virtually hundreds of private organizations and associations present in Tanzania ranging from very large to quite small. Below are brief descriptions of some, but not all, of the more important NGOs which have programs supporting child undernutrition interventions.

Salvatorian Mission Warehouse

The Salvatorian Mission Warehouse (SMW), based in New Holstein, Wisconsin, has been cooperating sponsor for a Section 416 Program operating in three regions of southern Tanzania since 1984. Components of the program consist of MCH feeding, pre-school feeding, general relief and institutional feeding. In 1985 SMW sent small quantities of Title II Emergency Program bulgur wheat and cornmeal to southern Tanzania; also UHT milk was sent to Tanga and Dar es Salaam. The 1986 program consists of 1,520 tons which includes 600 tons of bulgur provided under the Melcher Amendment.

OXFAM

The U.K.-based OXFAM has over 40 projects mainly concentrated in seven regions - Mara, Mwanza, Shinyanga, Tabora, Kigoma, Singida and Dodoma. The single largest programming area is health/nutrition with a focus on primary health care services. During the 1984 emergency, OXFAM supplied funds for the local purchase of 50 tons of maize for drought victims in Kwimba District of Mwanza Region, in coordination with district authorities.

Christian Council of Tanzania (CCT)

CCT is an umbrella organization for Protestant churches in the country. One of its departments deals with development services. It also has a national MCH coordinator and receives

food aid from the European-based Church World Service. During the 1984 emergency CCT distributed 2,000 tons of relief assistance but found the effort "too little and too late" (by one year).

Evangelical Lutheran Church of Tanzania (ELCT)

ELCT is the largest Protestant denomination in the country. ELCT concentrates its development program in the areas of environmental improvement, water, food production, animal husbandry, health education and training of village health workers. The latter two activities are major components of the Maasai Health Project in Arusha Region co-sponsored by Columbia University.

Tanganyika Christian Refugee Service (TCRS)

TCRS has operated several large refugee settlement schemes in western Tanzania. Food was supplied for several years by the U.N. World Food Program. TCRS also has an integrated development program concentrating on village water supplies in Singida Region.

Tanzania Red Cross

The Red Cross has branches in many parts of the country. During the emergency, Red Cross had food assistance activities in Mwanza and Shinyanga Regions.

3.3.3 UNICEF

UNICEF has two approaches to providing assistance to Tanzania. The first is support of national programs like the Expanded Program on Immunization (EPI), the Essential Drug Program (EDP), the National PHC Program, and logistical support to MCH services. The second approach is to concentrate on basic service programs in selected areas. This was expanded to include the Government of Tanzania/World Health Organization/UNICEF Joint Nutrition Support Program (JNSP), which started in Iringa Region in 1983.

Tanzania was one of the three countries initially selected for the JNSP in 1982. In consultation with the Tanzanian Government, Iringa Region was selected to be the pilot area on the basis of the very high rates of malnutrition, the range of agro-economic/ecological variety and the infrastructure present. The JNSP is integrated into the overall development plan for Iringa Region and run by Tanzanian personnel with the exception of one UNICEF program officer.

The nutrition situation in Iringa was analyzed using the conceptual framework described in Annex 1, which addresses the different levels of causality of nutrition problems (i.e. immediate causes, underlying causes, and basic causes). Plans were made to attack the most important causes simultaneously to enhance the impact of the intervention. The program addresses the immediate causes, especially disease factors and those underlying causes that most directly affect diet and disease. The overall aim is to reduce rates of malnutrition and infant and child mortality. Within Iringa Region, seven divisions were selected to participate in the JNSP comprising approximately 25% of the total population. These seven divisions cover a cross section of the agro-ecological zones in Tanzania.

The program has 12 projects with numerous sub-projects which can roughly be grouped into program systems (advocacy and other communication activities, monitoring and evaluation, and integrated education and training programs) and interventions (basic health services, child care and development, and household food security). There is elaborate management and infrastructure support and the program has a research component.

The main thrust of the program is aimed at the household and thereafter village level, while the more central levels (division, district and region) assure that the activities at the household and village level are maintained. Resources from outside have been provided e.g., transport, MCH-cards, ORT-packets, to enable continuation of initiated activities.

In the two years since its start, the program has put great emphasis on creating awareness of and sensitization to nutritional problems and their causality. To achieve this, advocacy has been very intensive and many people have been trained at all levels. The launching of the program in December 1983 and a large nutrition campaign in February - June 1984 shared information and generated support. During the campaign children were weighed and immunized and given MCH cards. There were feeding sessions using locally available germinated flour (Kimea) to reduce dietary bulk, ORT was propagated and the formation of health committees was initated. During the team visit results of the advocacy were seen at all levels; people are aware of the program, as well as the causes of malnutrition and the activities expected of them.

Another major activity has been the establishment of continuous monitoring and evaluation mechanisms at all levels. These were set up during the campaign, and data are prominently displayed in most of the villages. Not all children are weighed

regularly and it is not known how this selected sample compares to the total under-five population. Percentages of children weighed vary from 40% to more than 90% of the total under-five population.

Of the children weighed, the proportion of moderately and severely underweight children decreased between 1984 and 1985. These decreases run from 8 - 15% for underweight and 2 - 4% for severely underweight. To what extent this reflects the impact of the program and to what extent general improvement in living conditions, has not been determined. Divisional secretaries say that child-deaths have decreased in the program areas.

Analysis of immediate and underlying causes of malnutrition in Iringa indicate that low frequency of meals and high dietary bulk with low energy density have a direct impact on food intake. These problems are addressed by a child care system whereby day-care facilities are provided for young children while their mothers are busy with their daily activities. During the stay at the day-care facility the children are given one or two additional meals. The meals are prepared using germinated flour which reduces a very stiff calorie-dense maize porridge to a gruel which can be drunk from a cup. This technique greatly increases the energy density of the portion of food which can be consumed by a child at one sitting. Nutrition rehabilitation of malnourished children is also done at village level. Initially the centers were provided with food through JNSP (maize flour mixed with dried skim milk from Australia and germinated flour). These supplies only arrived once in 1985 and the villages were directed to draw up plans for providing food from village resources.

Of the three centers visited, one day-care center and one preschool group were in fact receiving flour through village collections. One center was not operating on the day of the visit. The village committee in one village has observed that children at the center were more playful, more alert, and better able to participate in learning and activity programs when they enter primary school.

The Village Health Workers (VHW) Program has proven crucial to implementing the program at village and household levels. The VHWs have initiated child feeding activities in many villages and are the key to the monitoring and evaluation activities of the project.

The JNSP includes major research components and also emphasizes the preparation of instructions for various types of individuals involved in providing services (village leaders, VHWs, divisional personnel etc). In addition educational and

demonstration materials are being prepared (including two films) which can be utilized in nutrition intervention programs in other parts of Tanzania. These resources should help to cut costs and increase the effectiveness of other nutrition intervention programs.

In 1985 a program for women and children similar to JNSP/Iringa was started in Kagera Region. Health services will be supported to provide universal immunizations and primary health care, in order to act upon the immediate causes of child deaths. Community development workers, village health committee members, etc. will be trained to enable them to attack the more fundamental causes. Similar programs will also operate in Shinyanga Region and Hai District of Kilimanjaro.

3.4 Response to the 1984/85 Food Emergency

In January 1984, reports reached into Dar es Salaam of potentially severe food shortages developing in the drought-prone regions of Tanzania. These shortages were the result of poor rains and partial crop failures, dating back in some areas to 1981.

One of the difficulties in responding to what is being labeled the 1984/85 emergency was the lack of reliable detailed information. Reports tended to be subjective and speculative. ("There's almost no food in the area and people are going to starve if something isn't done right now.") Some reports conflicted with other reports: one reporter would claim acute food shortages in, for example, Bariadi District; another reporter would relate that Bariadi farmers were selling their surpluses in Mara Region, which wasn't even supposed to be having food problems.

However, by April-May 1984 it was generally agreed that there was a serious food problem in eight regions. (Singida Region did not declare a food emergency although many observers felt an emergency situation existed.)

3.4.1 The Tanzanian Government Response

The government's (GOT) response to the drought took four forms of action: (a) easing up (although not totally eliminating) marketing restrictions; (b) GOT surveys and reports on the food situation; (c) importation of grain and (d) requests to donors for emergency food aid.

In early 1984, the GOT prohibited the movement of amounts of food over 30 kg out of any district without a special permit

issued by the District authorities. This was in part to control crop pests such as the Larger Grain Borer, and in part due to concern that surplus areas might rapidly become deficit areas if totally free movement of food were permitted. In September 1984, the quantity allowed to be transported across district lines without permits was raised to 500 kg.

In April 1984, the Prime Minister's Office (PMO) set up a commission to assess the food situation and make recommendations. Their confidential report was submitted in June. While never officially released, several parties had copies. The commission recommended several immediate actions:

a. importation of grain to cover food deficits;
b. tighter control of food flows out of the country and liberalization for importing consumer goods;
c. early procurement and distribution of farm inputs;
d. strengthening the Early Warning Unit and better crop condition reporting in the field;
e. establishment of seed multiplication efforts by contractors to TANSEED, the seed distribution parastatal.

The PMO issued a supplemental report in December 1984 specifically targeted at donors. It stated that NMC stocks were very low (no quantities given) but some grain (no quantities given) was being transferred from the four surplus regions of Iringa, Ruvuma, Mbeya and Rukwa to the drought-affected regions. This action was being augmented by "small quantities of aid" (not specified) and commercial imports (no quantities given). The report requested

a. food aid - 223,000 MT of maize and rice - through June 1985;
b. supply of farm inputs, especially improved seed, fertilizer and pesticides;
c. technical and material assistance to expand irrigation;
d. assistance to improve regional and village food storage; and
e. support to the transport sector: roads, vehicles, and spare parts

The GOT also purchased, between June 1984 and May 1985, 130,000 MT of grain. No cost information has been released, but at $200/MT the purchase would total some $26 million. This purchased grain was used to supplement NMC stocks and therefore most of it was probably consumed in Dar es Salaam.

Finally the GOT requested food aid from both multi- and bi-lateral donors. Besides the 223,000 MT general request, the

GOT wrote separate letters to all major donors in March 1985 with specific requests. Half of these requests were made known to USAID by the other donors receiving them; these totalled 165,000 tons. Finally in April 1985, the GOT attended a UNDP-sponsored meeting in Nairobi and requested 118,000 MT from the donor community through June 1985.

3.4.2 Donor Response

Many bi-lateral and some multi-lateral donors responded with offers of food aid grants or food for concessionary sales to the government. The rationale for the concessionary sales was that while much of the food would be marketed in Dar es Salaam, it would free up NMC to move stocks from surplus regions into the drought regions. This, for the most part, did not occur, and the small amounts transferred were inadequate to meet the drought induced need. The total amount of food aid supplied in this fashion was 71,500 MT by nine donor agencies. In addition, a number of agencies and donors provided food aid specifically targeted at the needs of drought affected communities.

The World Food Program responded to the emergency by making available 5,000 MT of cornmeal for a government-operated food-for-work program in the drought areas, principally Shinyanga Region. How much food for how much work is not documented, but first-hand observation indicated the amounts were very small and grossly inadequate.

The EEC has a regular food aid program which provides commodities for sale to generate counterpart funds. In response to the emergency, EEC donated an additional 4,000 MT of aid for government-operated food-for-work programs in Shinyanga and Mwanza. The same comments apply here as for the WFP supported food-for-work.

The NGO response ran the gamut from missions distributing hand-outs of personal food stocks to hungry families to the massive CRS 20,000 MT emergency program using U.S. supplied commodities. (This will be discussed in more detail below.) Much of the NGO response remains undocumented. The following paragraphs contain a brief description of the activities of some of the organizations to provide an overall indication of the actions taken.

The Red Cross (ICRC) assessed the food situation in mid-1984 and determined that the worst affected areas were in Shinyanga Region and Kwimba District in Mwanza Region. A total of 391 MT of imported food aid for 8,000 recipient families was decided upon for Shinyanga Rural. However, food distribution did not

begin until late January 1985. Rations were handed out by a team in a lorry who weighed children under five and then gave mothers a 24.5 kg ration package consisting of 18 kg of cornmeal mixed with milk powder (the mixing done in-country), 4.5 kg split peas, and 2 kg of cooking oil. The team could cover about two villages a day. By the time of the first distribution, ICRC stated that commodity and recipient levels should be increased by 500 MT and 16,000 families, bringing the total ICRC program to 891 MT for 24,000 recipients.

The Christian Council of Tanzania (CCT) had a somewhat larger program than the Red Cross. The CCT emergency response totalled 2010 MT of food aid, two trucks and some cash donations. The first 200 MT of cornmeal arrived in August 1984 and another 500 MT arrived a month later. There was a gap in food arrivals thereafter until April 1985. Principal donors were the World Council of Churches and Church World Service. Food was distributed through village food committees and recipient contributions were collected totalling about TSh 1.5 million. CCT stated that the program was extremely costly both in manpower and financial terms, and that the GOT did not cooperate as well as CCT had expected.

The OXFAM Field Director resisted OXFAM headquarter's desire to send in emergency food. His reasoning was that imported commodities were not the solution to the food problem in Tanzania, and it should be addressed in-country using local resources. On a regular tour of project sites in Kwimba District in February 1985, he observed that the situation had become desperate in that area. He released funds to purchase in-country 50 MT of maize and local government distributed the commodities to several of the hardest-hit villages in the Sumve Division of Kwimba District.

Concern, an Irish-based volunteer agency, also assisted by purchasing local commodities for distribution. The Tanzania headquarters of the agency is in the food surplus region of Iringa. Concern purchased 10 tons of potatoes in the area and sent it in one truck load to the Shinyanga Diocese Food Committee in June 1985.

The Salvatorian Mission Warehouse (SMW) applied for and was granted 422 MT of Title II Emergency food aid - bulgur and cornmeal - to be distributed along with the regular Section 416 dairy products in Mtwara and Lindi Regions (which were not officially drought-affected areas).

CRS requested commodities from the U.S. Government for use in the response to the emergency. The total volume of commodities provided were 20,386 MT of food for distribution to drought

victims, 2,000 MT of unrefined vegetable oil and 1,200 MT of refined vegetable oil for monetization to cover in-land transport and associated program costs, and a $1 million Office of Foreign Disaster Assistance (OFDA) grant to purchase eight 11 ton trucks, five supervisory 4-wheeldrive vehicles, fuel, tires, and spare parts. The total cost of the emergency program was about $14 million. Distributions were carried out in about 640 villages and 35 MCH Centers (which serve more than one village). The exact number of recipient families has not yet been determined but the round figure of 100,000 families in nine regions would be a fair estimate.

Three different rationing systems were employed. Most rations followed the General Assistance Program (GAP) method. A list of those families "without means" was prepared by local village and religious (not necessarily Catholic) leaders. These families received 22.5 kg of processed grain and one gallon of cooking oil per month. The Nutrition Intervention Program (NIP) began in a few villages in February 1985. All children under five were weighed and the families received the GAP ration plus 4 kg of milk powder. The MCH program increased the ration package from 5 to 9 kg in drought areas, meaning that a mother with two children under five received a total of 27 kg of food rather than 15 kg.

Some of the more important events during the USAID/CRS emergency response are summarized below:

The first reports that severe food shortages were developing in several regions were received in January 1984. USAID and CRS responded by including a 600 MT emergency food reserve in the FY 1985 Annual Estimate of Requirements submitted to AID headquarters in Washington (AID/W) in February. This request was turned down. From March through May CRS, USAID Tanzania, and REDSO ESA sent staff to the drought areas to make field assessments. The final trip was in May when the USAID Acting Director, the CRS Country Representative, and a Regional Food for Peace Officer from Nairobi visited Tabora and Shinyanga Region. Thereafter, USAID requested 10,386 MT of emergency food aid in two tranches of 4,761 MT and 5,625 MT plus 2,000 MT of unrefined vegetable oil for monetization. The proceeds of the vegetable oil monetization were to be used to defray CRS costs for transporting and distributing emergency food. Although AID/W approved this request in June, the first tranche did not begin arriving until October. The second tranche began arriving in March 1985. The vegetable oil for monetization arrived in November 1984. In September 1984, CRS requested an OFDA grant of $1 million. This was approved in three weeks.

In December 1984, CRS reported that emergency needs had doubled

since the initial assessment in March-May, and asked USAID to make an additional request of 10,000 MT. USAID forwarded this 10,000 MT request to AID/W and additionally requested 2,000 MT of unrefined vegetable oil to monetize for transport and distribution costs (this was later changed to 1,200 MT of refined oil) plus 1,500 MT of vegetable oil to carry out a 5,000 MT in-country grain purchase to cover an expected two-month gap in the food distributions in February and March 1985. Washington turned down the 1,500 MT oil monetization/in-country purchase request, but approved the 10,000 MT and a revised monetization request of 1,200 MT of refined oil for transport and distribution. The two-month gap occured as predicted. The second 10,000 MT arrived in July and August 1985, well after the crop harvests in March through June. The 1,200 MT of vegetable oil arrived in November. As of March 1986, CRS still had stocks of 6,000 MT of emergency food commodities. Some will be incorporated into the FY 1986 regular food program; the rest will be distributed by May 1986.

Below is a table of requests and arrivals:

Proposed Response	Request Date	Approval Date	Arrival Date
10,386 MT Food Aid 1st Tranche: 4,761 2nd Tranche: 5,625 +2,000 MT Vegoil	May 1984	June 1984	 Oct-Nov 1984 Mar-May 1985 Nov 1984
OFDA Transport Grant ($1 million) for vehicles, fuel, parts	Sept 1984	Sept 1984	Dec 1984 - Feb 1985 (vehicles & fuel)
10,000 MT Food Aid +2,000 MT vegoil (revised 1,200 MT) +1,500 MT oil for In-country grain purchase	Dec 1984	Feb - Mar 1985 April 1985 Not Approved	Jul-Aug 85 Nov 1985 -

3.4.3 Summary

In retrospect, it is easy to see the inadequacy of the responses of all of the donors described in section 3.4.2 above. But it is also necessary to take into account the uncertainty, confusion and difficulties faced by the parties attempting to make that response. In particular, the Washington PL 480 review and approval system was operating under a crushing overload generated by the Africa-wide drought

emergency featuring many country situations much more serious than Tanzania's.

On the positive side: the responses were noble efforts with the best of intentions that alleviated suffering and probably saved lives - to what extent it is virtually impossible to ascertain. On the negative side: almost all responses began too late; all programs involving importation of food experienced alarming arrival delays; some programs experienced management problems and some of the food aid was undoubtedly misused. The combined financial cost of all the responses cannot be calculated but would certainly run to many millions of dollars. At this point, individual agencies are evaluating their emergency programs and planning how they could do a better job the next time round. However, as yet there is no comprehensive planning effort underway to insure there is an effective, coordinated response to the next drought.

3.5 Conclusions

Certain conclusions can be drawn from the material presented in this section of the report.

Government Policy and Programs

The government has recently developed fairly comprehensive programs which address food and nutrition issues:

a. food self-sufficiency as a priority objective,
b. raising nutrition and income levels,
c. modification of pricing and marketing policies,
d. trade liberalization,
e. re-establishment of cooperatives,
f. introduction of 33 year land leases,
g. promotion of village level strategic grain reserves,
h. afforestation campaigns,
i. encouragement of oxenization, and
j. primary health care programs such as
    (1) child growth monitoring
    (2) village health worker training
    (3) the expanded program of immunization
    (4) the essential drugs program.

Some of the policies and programs are new and several years will be required to determine their impact. Others have yielded limited benefits due to implementation constraints. It can be concluded, however, that support for existing programs coupled with good coordination is likely to produce better results than the introduction of new programs.

Government Structure

Tanzania already has a well developed government and party structure which can be mobilized to deal with problems related to food security and child malnutrition. Although these structures have not always been so mobilized, JNSP has to a considerable extent effectively used existing structures to create an awareness of the underlying causes affecting child malnutrition and infant mortality in Iringa. Both the Maasai Health Project in Arusha Region and the Mvumi PHC Program in Dodoma have called upon existing structures to establish cadres promoting better health and nutrition at the village level.

NGO Programs

Several of the many non-governmental organizations in Tanzania are involved in programs which to some extent address the underlying causes of child malnutrition and food insecurity. OXFAM support of the Mvumi Village Health Promoter effort and other PHC programs and Evangelical Lutheran Church of Tanzania (ELCT) sponsorship of the Maasai Health Project are just two examples of NGO activities in the nutrition field. CRS is moving away from food aid distribution and into "family food security". Other NGO programs address problems in the food security area also. There is certainly no lack of NGO intervention and innovation in food and nutrition programming. As with governemnt programs, support of existing innovative programs which address the underlying causes of child malnutrition and food insecurity is preferable to instituting entirely new activities.

Emergency Response

As related in Section 3.4 above, the emergency responses alleviated suffering to an incalculable extent in 1984/85. They were also sometimes disorganized, uncoordinated, and very costly both in terms of money and human effort. Worse, failure to respond to the magnitude of the problem and delays in food aid arrivals were shortcomings which directly affected the intended recipients. An appropriate in-country response employing locally available resources could have addressed food needs more rapidly and effectively.

4.0 PROBLEM AREAS IN CURRENT FOOD AID USE

NGOs and government personnel, as well as the individuals involved with the administration of emergency programs, are attempting to address the problems of child undernutrition and of the food deficit areas. Certain of those efforts involve the distribution of food commodities received from a variety of sources. The team recognized the concern which motivated the organizations to distribute the commodities. The organizations were also making considerable efforts to assure that the commodities reached the intended recipients in good condition. This discussion of problem areas deals with the constraints involved in utilizing commodities in Tanzania, and is not a criticism of the efforts made.

In general, it is noted that the existing programs which involve external food aid commodities are essentially remedial in nature, and as such cannot succeed in the long run as the processes responsible for the problems continue to operate. It might be possible to develop programs utilizing food aid commodities which would be successful in addressing the underlying causes of malnutrition. However, it appears that the availability of commodities for distribution, and the administrative burden of managing them, may be deflecting the personnel of the organizations away from identification of approaches which would be less costly and more effective. A discussion follows of the constraints involved in utilizing the commodities to address child undernutrition problems and in the response to the 1984/85 emergency.

4.1 Limitations on the Impact of Direct Distributions of Food Aid in Addressing Undernutrition in Children

4.1.1 Cost

The problem of child malnutrition in Tanzania is very large. As is indicated in Section 2.3.2, there are 180,000-260,000 severely malnourished children and between 1.8 and 2.6 million moderately malnourished children. It is essential to find low cost approaches to addressing this problem or only a minor portion of the need will be met. In this context, the cost of using food aid for direct distribution to families is prohibitively high, especially in view of the deterioration of Tanzani's road network and its transport problems.

An example of the high cost of using food aid is provided by an analysis of the costs of the CRS program. At present it costs almost $57 per annum per mother or child to provide a ration and other services at a MCH center. Of that cost $29 is accounted for by the cost of procuring the commodities in the

United States and transporting them to Tanzania. The remaining $28 is mostly borne by the recipients and represents the cost of internal handling, administration and clinic activities. These costs are at least 60% in foreign exchange as they are primarily incurred in relation to transport.

The cost breakdown of the 60 kg annual ration package, i.e., 5 kg x 12 (at exchange rate of US$1 = TShs 16.5) is:

Commodity Cost	$21.36
Ocean Freight	7.55
In-country transport/handling	16.47
Distribution Center Costs	10.90*
CRS/NY Overhead	0.65
Total	$56.93

Source: CRS

* This figure is divided between approximately $6 in costs associated with the food ration and $4.90 in providing other services.

The cash contribution made by the families involved in the program is small in comparison to the benefits they receive in terms of commodities and services. The value of the commodities varies with local market prices, and is higher when commodities are scarce. For example, it is estimated by CRS that the annual local market value of the commodities provided in each ration was $348 in 1984. When the recipient contribution is subtracted, the net value was approximately $320. Clearly, the families reached by the program receive a substantial economic transfer (as mother and child are receiving rations, it totals $640 per family and where there is a second child under five enrolled, $960).

However, these benefits go to only a small fraction of those in need. The resources of the organization are also tied down in serving that small portion of the undernourished child population and the society as a whole is bearing the foreign exchange costs of moving the commodities to the recipients. If the organization could capitalize on the high local value of the commodities, and had the local currency equivalent of the local market value of the commodities available to use in its program, it could supply services to many more families.

4.1.2 Timeliness of Deliveries

The team encountered several instances where delays in commodity delivery had disrupted programs. When mothers learn that there are no rations at the MCH clinics, attendance often drops. The JNSP also had problems when village based programs distributed imported food aid. There was a considerable set-back when Australian milk powder due to arrive in July 1984 was delayed for over six months. The 1984 JNSP Annual Report states that this delay "actually came to serve as a very good demonstration to our villages that one cannot depend on external support..."

The direct food aid distribution did not necessarily enhance this nutrition intervention program. In fact, the delays experienced tended to reduce the effectiveness of other aspects of the programs, and motivated the JNSP to reduce its use of externally supplied food commodities.

4.1.3 Control of High Value Commodities in Short Supply

The energy density of the milk and oil make these the most valuable commodities supplied by food aid in addressing child undernutrition. They also have a high value on local markets and are in short supply. In these circumstances, it is not surprising that the team encountered persistent reports that commodities were being sold. If these sales were made by mothers who were using the proceeds to purchase other foods to feed the children (for example, a much larger quantity of grains could be purchased per kilo of oil sold) this might not have a detrimental effect on achieving the program goals even though it would be against the regulations. However, when families are selling the commodities, the cash may be used for a variety of purposes unrelated to food consumption.

It is likely also that a major portion of the sales dervie from theft and diversion of commodities in the process of getting them from the harbor to the recipient families. The team was unable to determine whether the problem of sales was as serious as it appeared to be from the reports. What is apparent, however, is that the effort to control the commodities is a heavy burden on the personnel and budgetary resources of the organizations distributing the commodities. It represents a particular problem in terms of the time of scarce health professionals who must assume accounting and policing roles in addition to their normal workloads.

4.1.4 Developing Local Responsibility to Address Child Undernutrition and Food Insecurity

Activities involving food aid could be more effective in addressing the problems of child undernutrition if they moved from their current base in clinics and became village-based. This perception derives from an awareness that major factors in the underlying causes of undernutrition are the low energy density of the foods the child receives and the frequency of feeding. The education provided at the clinics is ineffective in addressing these problems as it is focused on the mother. The women are in a subordinate position, and it is necessary to sensitize other family members and village leaders to the problems also. CRS recognized these problems and has established village-based activities in some cases.

In the village setting, the activities supported with food aid can undertake education activities with the village leaders and other family members, and the growth surveillance system will increase their awareness of the seriousness of the nutrition condition of their children. Presumably, this will help to ensure the children receive a better diet at home, and the food aid commodities can make a contribution to this result. In addition, the parents' contribution can be used to pay the salaries of village health workers and personnel to man day care centers thus creating a means to assure children are fed more frequently. The funds can also be used for development activities.

However, when the food aid programs move to a village base there are still major problems to be faced. The difficulties outlined above (cost, disruption of programs through delays or non-arrival of commodities, and commodity control) are increased. More seriously, there are major problems in arranging for continuation of the activities if the food commodities are no longer available for any reason. When villages are accustomed to receiving outside support of this type, it is a long process to develop a willingness to make resources availabe to continue the programs, and these efforts are often unsuccessful. There is a serious risk that the organization managing the program will be tied down in addressing a limited portion of the need, or will have to face the fact that activities will cease when it phases out of an area.

In the special circumstances of Tanzania, it is questionable whether organizations wishing to operate effective programs should take on these problems. As was indicated by the analysis in Section 2.0 above, some of the highest levels of

malnutrition are found in food surplus areas. In many cases villages can find the resources to meet the needs of their children if they are motivated to do so. They also can find means to support village health workers and day care center personnel from their own resources (the team observed this happening even in an extremely poor, food deficit area of the country). Supplying technical assistance to help them in this process, and limited material support (not including food) as is done by a number of organizations operating in Tanzania, appears to have a better chance of achieving the desired results.

4.2 Response to the 1984/85 Food Emergency

The review team visited four of the regions involved in the CRS emergency program; Arusha, Kilimanjaro, Dodoma and Shinyanga. Emergency food distributions are still being carried out. The review team was generally impressed with the efforts of the local officials and implementors to control the food and ensure that commodities were provided to truly needy households. The description of conditions at the height of the food crisis indicated also that it had been necessary to take extrordinary action to address the problems. By all accounts, the CRS emergency program "saved lives". How many is impossible to ascertain. However, the experience with the emergency program indicates there are problem areas which need to be addressed in planning for future food crisis situations.

4.2.1 Delay in Food Arrivals

The emergency food arrived too late. The first 10,000 MT was needed in July 1984 but did not arrive until October. The food gap in February and March 1985 may have caused considerable suffering to many drought victims - how many and to what extent remains to be ascertained. The second 10,000 MT was three months late. As it grew later and later there was a favorable harvest. By the time the commodities arrived they were not needed, particularly without a well thought-out distribution plan.

4.2.2 Cost of the Response

US $14 million were spent on the emergency program by the US government, including the cost of 20,386 MT of commodities and ocean freight, the OFDA grant and the two vegetable oil monetizations. This does not include certain other costs such as USAID and CRS staff time. Responding to emergencies is expensive, as these figures indicate, especially when it is remembered that the Tanzania emergency of 1984/85 was a limited one. However, if it had been possible to use food aid

monetizations to purchase commodities from food surplus areas for transportation to the drought areas (as was proposed by CRS) the cost could have been reduced substantially.

The oil provided for the two monetizations cost $3.5 million in commodity cost and transportation, and it yielded the Tanzanian shillings equivalent of $11 million for inland transport and associated costs. Although the negotiations for the monetizations were complicated, the Tanzanian government was prepared to cooperate in ensuring the maximum amount of funds were available to use in the drought response. Every shilling not required to cover the costs of the commercial processor and the parastatal distributor went to the counterpart fund. Monetization of roughly twice the amount of oil would most likely have produced sufficient funds to purchase the emergency grain requirements locally and pay for their transportation to the drought areas. However, this was not possible in 1985/85 and using the approach in future would require establishing agreed procedures in advance if long delays in implementation are to be avoided.

4.2.3 Impact on Existing Activities

The emergency program required heavy inputs of staff time by all parties concerned. The difficulties involved were especially apparent to the team in their conversations with CRS field staff. All available staff had been drafted to cope with the extra demands of logistics, commodity control and distribution plans for the emergency foods. After nearly two years with several more months to go, technical personnel in particular were frustrated with the lack of time for regular program work. Trained nutritionists and community development personnel were unable to provide the level of supervision of their programs which they considered desirable. As a result the positive new initiative of CRS in establishing village MCH programs with Associated Development Activities has essentially been in neutral for the last two years.

It is impossible for any organization to keep staff on board to cope with the occasional unusual demands of emergency activities. In these circumstances experienced and trusted personnel have to be utilized whatever their specialties. However, utilization of other mechanisms such as normal market channels would be preferable to distorting regular program activities. Plans have to be made in advance for the establishment of mechanisms to organize such a response if this is to be a viable alternative.

4.2.4 Dependency Creation

Finally, the dependency factor - although impossible to calculate - should not be discounted. One year after the period of severe food stress was finished, officials and villagers are still asking for emergency food aid, which may appear to them an easier option than redirecting production or establishing drought preparedness arrangements.

5.0 SUGGESTED STRATEGIES FOR SUPPORT OF INTERVENTIONS

The Team considered the experience of existing programs and identified interventions which appear to have the best potential to address the major problem areas of child undernutrition, and food deficit/drought prone areas. The elements of these programs are set forth below following a discussion of the importance of arranging for coordination with government programs and strategies. NGOs and local government can seek funding for these activities from a number of sources, and it is noted that a major portion of costs are in terms of local currency.

5.1 Coordination with Government Programs and Strategies

As was apparent from the description in preceding sections of the paper, the Tanzanian Government has extensive policy instruments as well as operational programs which are addressing the problems of food and nutrition in the country. In the course of the review, the team was impressed by the importance of ensuring that donor agencies, whether bilateral, multi-lateral or NGOs, arrange for coordination with government officials particularly at the district and local levels.

Donor agencies need to be aware of the considerable local variation in the approach to problems. Local government also often has programs underway which can be supported rather than establishing an alternative project structure. At the least, it is important not to introduce elements in programs which can create conflicts between and within villages which are receiving different resources. An example is the problems which have occurred when external organizations agreed to pay VHWs initially rather than insisting that villages make arrangements for their support from the outset. Finally, there are numerous external organizations operating in Tanzania. Although they may be generally aware of each other's activities at the national level, they may end up with overlapping or even conflicting programs in local areas. Some coordination mechanism is needed, and the most logical points are the regional, district and village governments.

5.2 Mobilization of Local Initiative to Address Child Undernutrition

Many professionals contacted by the review team emphasized the importance of creating village based services to address mother and child malnutrition problems. Their attitude is exemplified by the decrease in emphasis on utilization of the Nutrition Rehabilitation Units (NURU) at Kilimanjaro Christian Medical Center (KCMC) and Mvumi Hospitals. In both cases, the

professionals running the units are concentrating their efforts on village-based activities. These are developed most completely at Mvumi where the NURU is virtually closed in preference to village based programs including rehabilitation of severely malnourished children. CRS also recognizes the importance of moving to village-based activities and has established such programs in two of the nine regions where it operates currently. The constraints on utilizing traditional health facilities (hospitals, dispensaries, health posts) as the basis for nutrition interventions are reviewed below, followed by a discussion of the essential components of a village-based program which is suggested by the experience of existing interventions.

5.2.1 Constraints on Utilization of Traditional Health Facilities as a Basis for Programs

The constraints on using traditional health facilities as a basis for programs were touched on in Section 4.0, as food aided programs have generally operated from them. The discussion here provides further detail, and also illustrates that the requirement to redirect the focus of activities to the villages is not confined only to programs involving food aid.

a. Magnitude of the problems faced: the magnitude of the levels of malnutrition outlined in Section 2.0 above is a major constraint on the effectiveness of using fixed health facilities as the basis of programs. NURU typically have facilities for only a few children and their mothers at a time, and stays may vary from two weeks to several months. An initial survey of the nine villages to be covered by the Mvumi Primary Health Care program identified 210 severely malnourished children. Services of necessity had to be developed in the villages because the NURU at Mvumi Hospital could accomodate only six patients at a time. The costs of foods required to treat the severely malnourished would also be prohibitive, if anything approaching coverage of the 250,000 children nationally in that category were to be attempted by the health services. Obviously the costs of addressing the problems of the 1.8-2.6 million children in the mildly malnourished category are even more difficult to support.

b. Difficulties in creating local consciousness of the support needed for mother/child nutrition improvement: the growth surveillance and health education activities provided at MCH clinics are valuable; however, in most cases, only the mother benefits from this information. She must then convince her husband and other decision-makers of the importance of providing foods

required by the child, and of making arrangements for regular feeding and child-care. In the absence of general public awareness of the problem, mothers face difficulties in this regard, especially in view of their generally subordinate position in society and the economic value of their labor in alternative activities such as agricultural production.

c. Relevance to household and village-specific contexts: clinic based programs usually operate 20 days a month, and involve 1000-2000 mothers drawn from a wide catchment area. Staff generally have limited time or transport to carry out home visits. However, the problems of child under-nutrition require household and village-specific solutions. These will vary greatly. What is required is a continuous effort and follow-up from individuals living in the village who are well-informed and sensitive concerning local conditions and the situation of individual households. This cannot be accomplished by clinic based personnel.

5.2.2 Activities to be Included in Village Based Programs

Suggestions for activities to be included in village-based programs are outlined below. These were identified by the team following review of the various interventions which are underway in several areas throughout Tanzania. These activities are all included in the JNSP in Iringa; however, their inclusion here is not meant to imply that the team endorses only programs which follow the pattern of the JNSP. The JNSP is currently undergoing an external evaluation which should assist in determining the impact of the various interventions, and may result in modifications in the program. In addition, the objective of the JNSP is the reduction of child mortality. Our concern here is with reducing levels of undernutrition. As a result, not all of the specific health-related interventions have been included in the suggested approach.

a. Sensitization of local leaders and households to the problems of undernutrition. Activities included in this will be to a large extent training - multisectoral and at all levels (workshops and seminars). Village based nutrition surveys can serve as a focal point to highlight specific problems and serve as a base for analysis and action.

b. Establishment and support of village health personnel (i.e. VHW, Village Health Promotors, TBA), to provide continuous education and follow-up with village leaders

and individual households. This essentially means supporting components of the national PHC strategy. A curriculum review will be needed to make sure the right information is disseminated.

c. Introduction of a growth surveillance system and village registers of children. This system educates village leaders and households concerning the seriousness of the problems of undernutrition of young children. It also serves as a basis for monitoring the status of children, and for evaluating the results of the program.

d. Utilization of improved weaning foods. Training of VHW in the methods of preparing improved weaning foods (such as the energy dense uji prepared with germinated flour described in section 3.3.3) and extension of the information by the VHW to the mothers in the village are essential elements of this component. (Annex 6 describes the preparation of germinated flour as developed by TFNC.)

e. Establishment of rehabilitation and maintenance systems within villages. Children who need rehabilitating are too numerous to be taken up by existing health facilities. Also a prolonged stay elsewhere disrupts family life and means no care for siblings and less food production at home. Village based centers should be established utilizing food provided by the village and personnel based in the village - e.g. grandmothers who have time to care for malnourished children at a center.The rehabilitation should emphasize frequent feeding with energy-dense foods. The system must be complemented by a village based growth surveillance system.

5.2.3 Cost-Effectiveness of the Proposed Intervention

The suggested approach should be much less expensive than programs which involve donated foods with their high transport and logistical costs, while providing a more comprehensive and reliable support system to mothers and children. The JNSP estimates that the services provided by the program could be intoduced into an area for an approximate cost of $10 per annum per child served, and $5 per annum per child for expansion of a program (the current cost of the JNSP is $20 per child served but that figure includes a large element of research, development of materials, training programs, etc). The JNSP figures may underestimate all the costs involved. However, when $10 per child is considered in contrast to the almost $57 per annum which it takes to provide a ration plus services at a food aided MCH clinic (which fails to provide a comprehensive

and self-sustaining support system for the mother and child) the orders of magnitude lead us to recommend a shift away from distribution of imported food commodities.

5.3 Addressing the Situation of Food Deficit Areas

Any cost-effective solution to Tanzania's scattered, localized food deficit problems should take into account food production and marketing realities. Large surpluses are produced in border areas, where it makes economic sense to producers to illegally export them in some years. High transport costs between the remoter surplus areas and northern deficit areas are part of the reason for this. Another part has been the failure of the GOT to encourage and support the development of private grain marketing to supplement official channels. Finally, the availability of consumer goods in neighboring countries and Tanzania's own comparative shortages create great profit-making opportunities for entrepreneurs willing to engage in this trade. Until these underlying factors change, food deficits in Tanzania will not solve themselves. Extraordinary measures of some kind, whether GOT or donor funded/implemented, will continue to be called for to supply food to areas where it is needed whether from within Tanzania or from external sources.

The food grain market in Tanzania is fragmented, with the urban sector supplied mainly by NMC purchases and donor assistance, and the rural market supplied mainly by the unofficial system. Increasing supplies to NMC or sending in emergency food aid, unless provision for targeting and delivery is also provided by the donor, may merely serve to help meet urban demand, with very little additional reaching the rural areas. Even if supply is adequate, the necessity of selling household-held grain early in the season to meet expenses or procure consumer items may result in inadequate income to procure sufficient grain at the higher prices demanded later in the season. In any year, drought-affected, normal or surplus, supply as a redistribution of available grain and other commodities is restricted by an inadequate transportation network exacerbated by recurring fuel shortages. Rural food security thus becomes primarily a question of rural self-sufficiency. Lele and Candler ("Food Security in Developing Countries: National Issues") identify four elements which are important in achieving such self sufficiency:

a. promotion of drought-resistant crops;

b. provision of a market for surpluses of drought-resistant crops;

c. increasing efficiency of rural markets (which would

include as an element improved transportation); and

d. improved farm-level storage.

The GOT already has underway an intensive campaign to promote cultivation of drought-resistant crops which includes mandatory acreage in many areas. It is also strengthening the rural market sector through changes with respect to cooperatives and liberalization of purchasing and marketing of food. However, the review team believes two further steps should be taken to address the problems of the food deficit/drought prone areas. The first step is preparation of a comprehensive plan for measures to reduce the frequency and severity of food emergencies, and establishment of specific procedures to use in coping with such emergencies when they do occur. The second step is the creation of a fund to provide a support mechanism for the areas. This fund would serve as the means to implement the plan. Government bodies and private organizations could apply to it for support of activities to ameliorate conditions in the areas. The fund could also serve as the funding source for measures to implement the previously agreed upon prcedures in food emergency situations.

Examples of the types of activities which could be supported by the fund are:

a. Establishment of sorghum mills to increase the attractiveness of the crop to rural households. During the review we were advised on several occasions that resistance to planting sorghum, especially the "Serena" variety, was due to the problem of palatability (which could be solved by dehulling) and the lack of suitable sorghum milling facilities. Existing maize grinding mills cannot be used for this purpose, but they can be readily adapted. There are facilities available for fabrication of these attachments and other milling equipment in Tanzania. Local government and NGOs could assist in introducing this equipment in villages utilizing support from the fund.

b. Construction of farm and village level storage. Villages and households could provide better for their own food security if adequate facilities for food storage were increased. It is speculated that a portion of household sales of crops at harvest is actually a risk-spreading exercise as households are aware they will lose a portion of their crops to pests if they attempt to store it. Storage facilities either at the household or village level could be increased to address this problem.

c. Assistance to cooperatives and the NMC in constructing district storage of millet/sorghum. Assistance of this kind should be specifically focused on increasing district level food supplies in drought prone areas so the village shops will be able to purchase supplies at reasonable prices in times of shortage.

d. Assistance to transport grain from food surplus to food deficit areas. During the 1984/85 food emergency, USAID considered the possibility of monetizing food commodities and utilizing the funds to purchase and transport food from other areas. However, there was no existing mechanism to accomplish this. If such a fund were in existence, contingency planning could begin as soon as the possibility of an emergency arose to identify whether adequate food stocks were available anywhere in the country. The fund could be utilized to transport the commodities to the affected areas early on so they could be available for sale in time to avoid dramatic price rises. Only in extreme circumstances would commodities be distributed free. Donor contributions to assist in the emergency could take the form of increasing the funding available for this purpose.

e. Support for employment-creating activities in villages. This intervention is designed to address the problem of poor households which fall into a cycle of working on the fields of others in order to secure food, thus failing to cultivate adequate food for their needs in the subsequent year. These households would not be helped by the additional availability of food for purchase in the villages if their cash funds were not sufficient for the purpose. Cash for work projects could be organized for this purpose in the period prior to the start of the cultivation season if possible. The types of projects to be included would be those which assist in ameliorating the food production situation in the area, i.e. rural roads, afforestation, water development, soils conservation and management. A further method which could be considered especially in the year following a major drought, would be to pay farmers for working on their own fields. To avoid creating expectations of regular wage employment, farmers could be required to make specific improvements to their fields, as well as show evidence of cultivation, in return for specified cash amounts.

6.0 CONCLUSIONS

The American members of the team had a bias going into the review. That bias was toward a food aid program for Tanzania involving some form of direct distribution to recipients. The team coordinator is a former AID Food for Peace Officer and continues to assist in programming U.S. food-for-work activities in Africa. The Regional Food for Peace Officer is responsible for backstopping PL 480 programs throughout Eastern and Southern Africa. The USAID Food Monitor presently makes his livelihood by working in the Tanzania PL 480 program. The USAID Agricultural Economist spends a good deal of time gathering data to assist with the execution of the current U.S. food program in Tanzania. None of the team members anticipated that this report would conclude that food aid involving distribution is ineffective in reducing child malnutrition. Yet after analyzing the available data and conducting interviews with professionals both in Dar es Salaam and in five regions over a fourteen day period between February 20 and March 5, 1986, the team was unanimous in concluding that :

a. food aid involving direct distribution is not the most cost-effective approach to reducing child malnutrition;

b. this form of food aid as presently organized is not effective in addressing the many underlying causes of child malnutrition and food insecurity;

c. given that 40 - 60% of Tanzanian children (1.8 - 2.6 million) are undernourished, and that 11 out of 20 regions are drought prone, the extent of the need for food related interventions in Tanzania is so great that it cannot be addressed realistically in a food distribution program with its high per unit costs; and

d. in many cases, direct distributions distract communities from seeking solutions employing local resources.

These conclusions were based on both data and observations which can be summarized as follows: overall child malnutrition rates do not vary a great deal between regions. However, food surplus areas frequently have high rates while some food deficit areas seem to have slightly lower rates. Production of food within a region demonstrated no strong correlation with moderate malnutrition, as measured by the proportion of children under 80% of standard weight for age. Child undernutrition and food insecurity are both linked to food

maldistribution on three levels:

a. intra-family - energy density levels of food and frequency of feedings are inadequate to meet minimal nutrition requirements of small children;

b. intra-community - certain segments of the community do not have adequate access to resources, goods and services which has a negative impact on child nutrition and family food security; and

c. inter-area - constraints in transport and management affect the movement of food between surplus and deficit areas of the country.

In examining current structures, policies and programs, the review team concluded:

a. Existing village organization and local government structures can be mobilized (and in a few cases are being mobilized) to address the underlying causes of child undernutrition and food insecurity.

b. Policy reforms such as improved price incentives, changes in marketing structure, and trade liberalization have been made in Tanzania which address both child nutrition and food security.

c. Government and various NGOs have current programs which deal effectively with child undernutrition. Several other programs are beginning to address food security issues. It would be more beneficial and cost effective to support existing efforts than to continue to provide U.S. food commodities for direct distribution.

With regard to the emergency response by the Tanzanian Government and various donors to the 1983/84 drought, the team concludes:

a. The various responses did alleviate suffering and save lives.

b. Almost all programs were begun too late and delays in the arrival of emergency food aid caused further program setbacks.

c. A more cost-effective future response to droughts affecting limited areas should include the development of local resources and mechanisms to mobilize food produced in Tanzania's food surplus regions.

d. Only in cases of severe drought should imported food

aid be used to respond to food emergencies.

Given the above conclusions based on analysis of available data, interviews and observations, the team concluded that the following strategies would be the most appropriate to address child undernutrition and food insecurity in Tanzania:

a. Child Undernutrition

(1) Programs should be carried out in collaboration with village and local government and NGO activities.

(2) Programs should be village based.

(3) Programs should include:

(i) sensitization of households and village leadership to undernutrition problems through child nutrition surveys and educational programs;
(ii) training and/or support for village health personnel;
(iii) growth surveillance systems and child registries;
(iv) promotion of improved weaning foods such as kimea ; and
(v) establishment of nutrition rehabilitation and maintenance systems within villages.

b. Food Insecurity

(1) Actions should be coordinated with government and NGO activities.

(2) There is a need for a comprehensive food emergency preparedness plan for needs assessment, decision making and phased or layered responses by Tanzanian and international entities to different degrees of need.

(3) Programs could include:

(i) drought resistent crop marketing development and processing;
(ii) farm and village level storage;
(iii) support to cooperatives in purchasing and storage of crops at the district level; and
(iv) assistance in the transportation of grain from food surplus to food deficit areas.

BIBLIOGRAPHY

1. Field project of M.A. Students Bugando Hospital, 1981.

2. Government of the United Republic of Tanzania, Arusha Regional Medical Office: Regional Nutrition Officers Report on Nutritional Status of Under-Fives in Orkesmet, Kiteto, Nainohanoha Ward, Ngorongoro and Endoji, Mbulu. 1983.

3. Government of the United Republic of Tanzania, Ministry of Agriculture and Livestock Development: National Food Strategy: Volumes I and II. Dar es Salaam, 1984.

4. Government of the United Republic of Tanzania, Ministry of Agriculture and Livestock Development, Task Force on National Agricultural Policy: The National Agricultural Policy. Tanzania, 1982.

5. Government of the United Republic of Tanzania, Ministry of Health: Guidelines for the Implementation of the Primary Health Care Program in Tanzania. Tanzania, 1983.

6. Government of the United Republic of Tanzania, Ministry of Health, MCH-Unit: MCH Statistics, by Region and Selected Districts 1980-1984. 1986.

7. Government of the United Republic of Tanzania and UNICEF: Analysis of the Situation of Children and Women . November 1985.

8. Government of the United Republic of Tanzania, Ministry of Health and World Health Organization: Joint Primary Health Care Review. Tanzania, 1984.

9. Jacobsen, O.: Economic and Geographical Factors Influencing Child Malnutrition. BRALUP Research Paper No. 52, Dar es Salaam, March 1978.

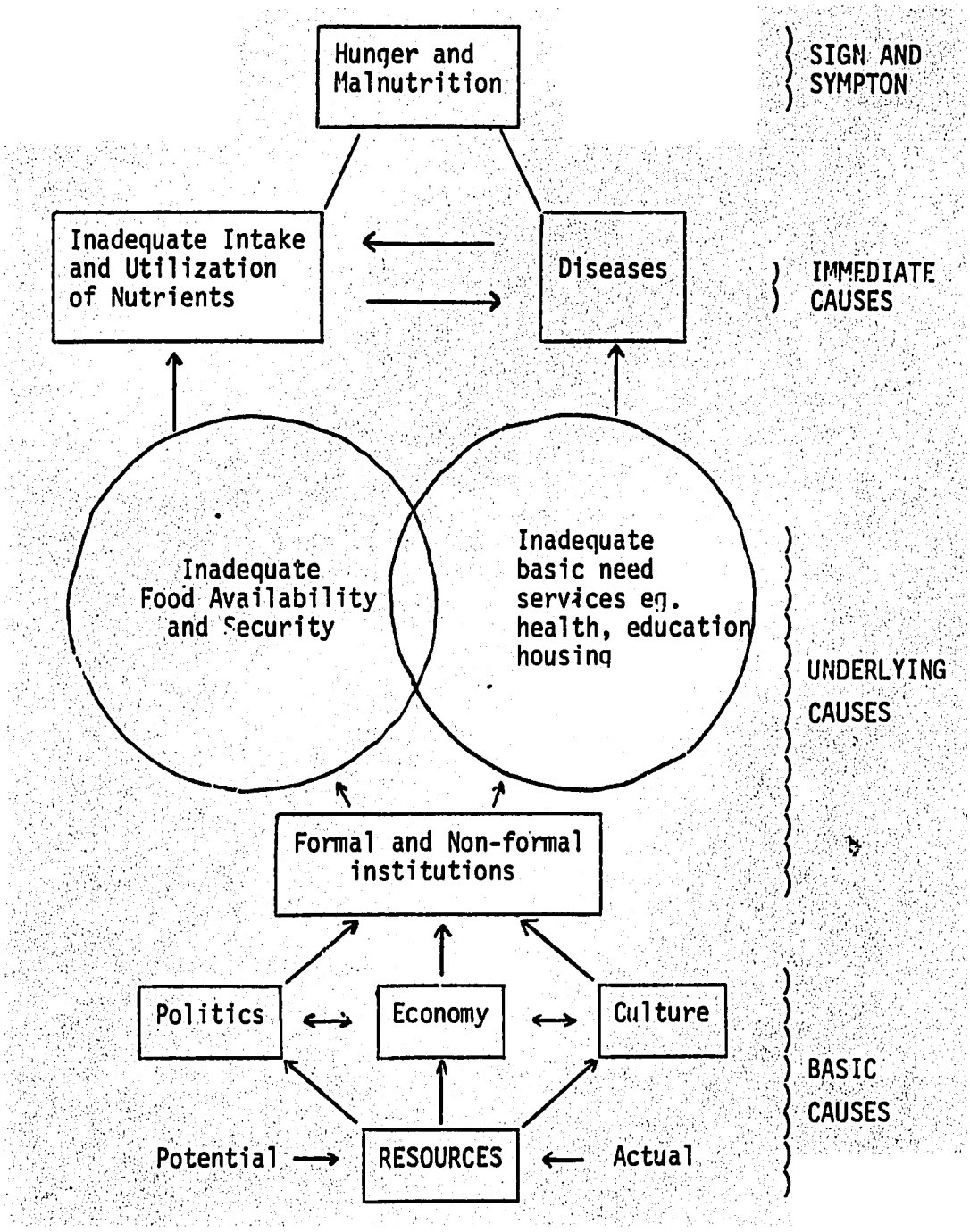
10. Lele, Uma and Wilfred Candler: "Food Security: Some East African Considerations." From Food Security for Developing Countries , edited by Alberto Valdes, Westview Press, Colorado, 1981.

11. Lyungvist, Bjorn: Iringa Nutrition Survey, Main Report. TFNC Report No. 692, Dar es Salaam, 1981.

12. Mgaza, O. and H. Bantje: Infant Feeding in Dar es Salaam. TFNC Report No. 484, BRALUP Research Paper No. 66, Dar es Salaam, November 1980.

ANNEX 1

A conceptual framework for the causes of hunger and malnutrition



Source: Kavishe, Festo P. and Urban Jonsson: Conceptual Approach in Defining the Problem of Hunger and Malnutrition. Dar es Salaam, 1986. Page 13

ANNEX 2

List of People Visited

1. M/s Geri Sicola - Director, CRS, Dar es Salaam
2. Mr. Bob Bell - Assistant Director, CRS, Dar es Salaam
3. Mr. Bill Powell - FAO, Early Warning System, Dar es Salaam
4. Mr. Magembe - UNICEF, Dar es Salaam
5. Mr. Buratoki - Director, World Food Program, Dar es Salaam
6. Dr. B.E. Moshi - RDD, Arusha
7. Mr. Kapela - Regional Planning Officer (RPO), Arusha
8. Dr. Berege - Ag. Regional Medical Officer (RMO), Arusha
9. Mrs. A. Mgonja - Regional MCH Coordinator (RMCHC), Arusha
10. Mr. Mahenge - Evangalical Lutherian Church of Tanzania (ELCT), Arusha
11. Mr. Bob Robinson - Adventist Relief and Development Association (ADRA), Arusha
12. Mr. M. Gadi - District Executive Director, Monduli
13. Mr. Mashobi - District Planning Officer (DPO), Monduli
14. Dr. Sauli - District Medical Officer (DMO), Monduli
15. Mrs. Musira - District MCH-Coordinator (DMCHC), Monduli
16. Mr. Giraha - District Health Officer (DHO), Monduli
17. Mr. Makundi - Supervisor of District Council
18. Mr. Sitayo - Maasai Health Project, Arusha
19. Dr. Jacobsen - Maasai Health Project, Arusha
20. Mrs. Marenga - KCMC Hosptial Nutrition Rehabilitation Unit, Moshi
21. M/S Tesha - KCMC, Nutrition Rehabilitation Unit, Moshi
22. Mr. O. Anacleti - OXFAM (UK), Director, Arusha
23. Mr. J. Semwaiko - RDD, Shinyanga
24. Mr. Njau - RPO, Shinyanga
25. Dr. Kimambo - Ag. RMO, Shinyanga
26. Mr. Munubi - Ag. Regional Agricultural Officer (RADO), Shinyanga
27. Mr. Njuu - District Executive Director (DED), Shinyanga Rural
28. Mr. S. Mbogo, CRS, Shinyanga
29. Mrs. Mahungu - MCHA, Kolandoto Hospital, Shinyanga
30. Dr. Kiberiti - Medical Officer-in-Charge, Kolandoto Hospital, Shinyanga
31. Sister Miriam - Gula Mission, Shinyanga
32. M/S R. Kimenya - Ag RMCHC, Shinyanga
33. Mr. M.D. Mapunda - RDD, Dodoma
34. Mrs. A. Abdallah - Regional Commissioner (RC), Dodoma
35. Mr. Shemahonge - District Commissioner (DC), Dodoma Rural
36. Mrs. J. Chitenje - CRS, Dodoma
37. M/S Grace Makiko- CRS, Dodoma
38. Dr. Ma i - Medical Superintendent, Mvumi Hospital
39. Dr. Ma . ora - Head, Community Health Department, Mvumi Hospital
40. Village Government Leaders (some) - Cha a village, Dodoma Rural
41. Mr. E.N. Mudogo - RDD, Iringa
42. Dr. B. Ljungqvist - JNSP, Iringa
43. Mrs. G. Mtalo - JNSP, Iringa
44. Dr. Mkumbwa - JNSP, Iringa
45. Dr. Senappa - JNSP, Iringa

46. Mr. Kahatano - JNSP, Iringa
47. Mr. C. Nugent - Director, CONCERN, Iringa
48. Mr. Ali Mohammed - Chairman, Nzihi Village, Iringa Rural
49. Mr. Maliva - Chairman, Magulilwa Village, Iringa Rural
50. Mr. V. Mbuta - Secretary, Magulilwa Village, Iringa Rural
51. Mr. E. Kasike - Manager, Magulilwa Village, Iringa Rural
52. Mr. Miyonzo - Assistant District Planning Officer, Iringa Rural
53. Mr. J.L. Millinga - District Planning Officer, Iringa Rural
54. M/S Kisa - Ilula Health Worker, Iringa Rural

ANNEX 3, TABLE 1

FOOD AVAILABILITIES: GRAMS PER PERSON PER DAY OF EDIBLE STAPLE FOODS AND PULSES PRODUCED IN REGIONS.

	82-83*	83-84	84-85
ARUSHA	257	410	447
COAST&DAR	867	418	198
DODOMA	329	165	175
IRINGA	600	1065	874
KAGERA	306	544	1100
KIGOMA	813	693	723
KILI.	322	806	746
LINDI	443	1177	920
MARA	354	759	724
MBEYA	443	736	772
MOROGORO	464	342	654
MTWARA	1183	984	1101
MWANZA	524	726	805
RUKWA	1071	1136	1284
RUVUMA	931	1336	1172
SHINYANGA	762	834	1275
SINGIDA	336	886	530
TABORA	497	739	1084
TANGA	392	485	604

* 82-83 ESTIMATES DO NOT INCLUDE BANANAS OR PULSES OTHER THAN BEANS.

Note: This table was created using early Warning Unit production estimates. The gross production estimates were reduced for feed, seed, waste and milling losses using FAO estimated rates, and divided by estimated regional populations for the relevant years. Thus estimates of available staple foods and pulses per person, per day were derived. The reader is cautioned against using these estimates in any way other than to provide a rough idea of the comparative availability of locally produced foods in Tanzania's various regions. This exercise provides no information on the volumes of food either privately or officially marketed into or out of regions or over international borders. Furthermore, as these are averages they hide inequities between areas, villages, families, and individuals within regions. The detailed calculations leading to these estimates are available on request from the USAID/Tanzania mission.

AVERAGE ANNUAL CASH AND NON-CASH INCOME AND CONSUMPTION OF SELECTED FOODS, PER HOUSEHOLD

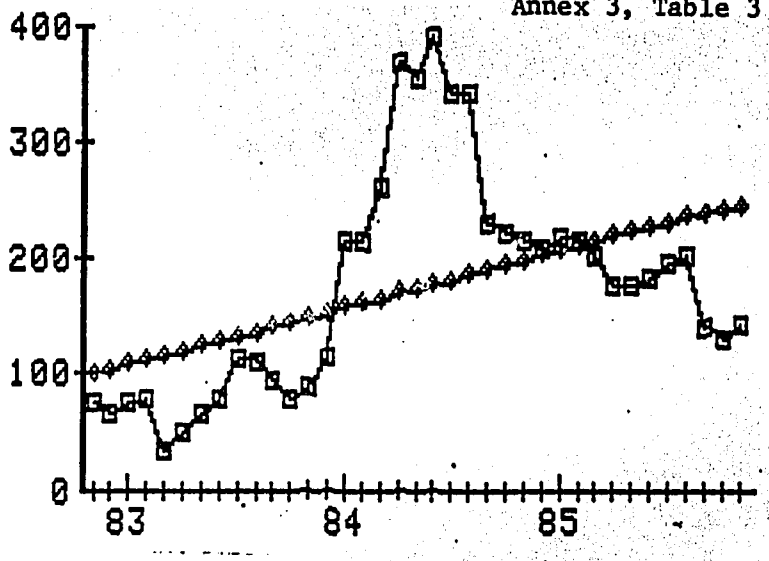
REGION	A. CASH INC/ HH	B. NON-CASH INC/H	C. TOTAL CEREAL	D. RICE	E. MAIZE GRAIN	F. MAIZE FLOUR	G. SORG/ MIL. GRAIN	H. SORG/ MIL. FLOUR	I. CASS-AVA	J. SWEET POTA-TOES	K. COOK-ING BANANA	L. PULSES	M. NUTS	N. MEAT	O. FISH	P. MILK PRO-DUCTS	Q. OILS AND FATS
DODOMA	1829	2196	801	20	48	262	53	416	2	2	1	57	41	58	2	61	1
ARUSHA	2881	2228	822	49	262	464	17	19	6	23	26	89	2	55	8	130	13
KILIMANJARO	5492	2665	678	99	171	387	1	5	9	73	442	162	12	90	19	75	19
TANGA	3638	1599	676	59	147	456	0	1	138	56	126	70	50	51	29	15	2
MOROGORO	4607	1938	911	164	112	614	2	6	61	27	80	86	27	70	24	8	1
COAST	2482	1342	655	108	60	463	2	11	61	12	27	92	31	29	14	2	1
DSM	10988	319	553	202	6	316	0	1	47	50	28	89	141	92	26	3	8
LINDI	1960	1837	502	87	13	352	5	41	62	25	26	97	29	13	10	0	1
MTWARA	2143	2037	359	87	15	186	27	30	332	18	5	105	40	13	22	0	0
RUVUMA	2599	2477	568	84	6	436	7	18	221	27	62	105	8	22	16	1	0
IRINGA	1961	2326	786	30	126	564	1	20	18	18	1	212	1	45	11	1	0
MBEYA	2874	2192	668	81	167	379	13	13	39	59	72	168	9	41	22	14	1
SINGIDA	1881	2657	1052	37	46	391	32	541	23	48	11	62	7	52	10	18	1
TABORA	4319	2816	1007	88	232	580	14	72	87	112	1	48	36	78	21	43	2
RUKWA	3634	5226	1672	22	50	903	6	601	203	57	23	578	9	60	18	-	2
KIGOMA	2814	7317	1346	12	35	1203	1	89	272	258	228	1380	3	24	24	9	5
SHINYANGA	2706	2237	795	96	106	329	48	202	45	165	0	30	9	54	14	100	7
*W. LAKE	4834	2058	108	27	6	47	14	9	85	246	1524	121	9	53	16	11	2
MWANZA	3205	1869	647	60	101	349	28	58	358	236	4	37	1	73	2	88	1
MARA	5843	1784	942	46	30	164	29	24	42	348	3	93	1	103	11	1	3

SOURCE: 1976/77 HOUSEHOLD BUDGET SURVEY, TABLE 10A, REGIONAL BREAKDOWNS. PROVIDED BY BUREAU OF STATISTICS, MINISTRY OF FINANCE. FIGURES IN COLUMNS A AND B IN SHILLINGS PER HOUSEHOLD; IN COLUMNS C-Q, KILOGRAMS PER HOUSEHOLD, PER ANNUM.

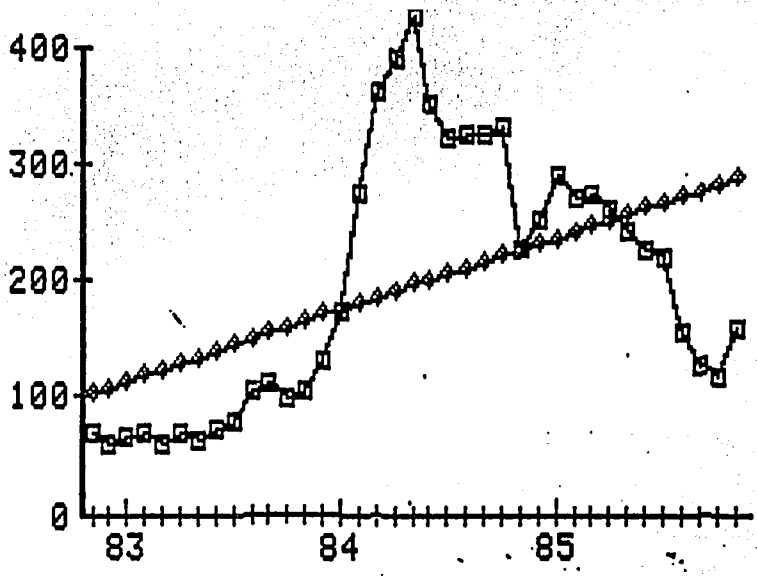
* West Lake Region is now called Kagera

Annex 3, Table 3

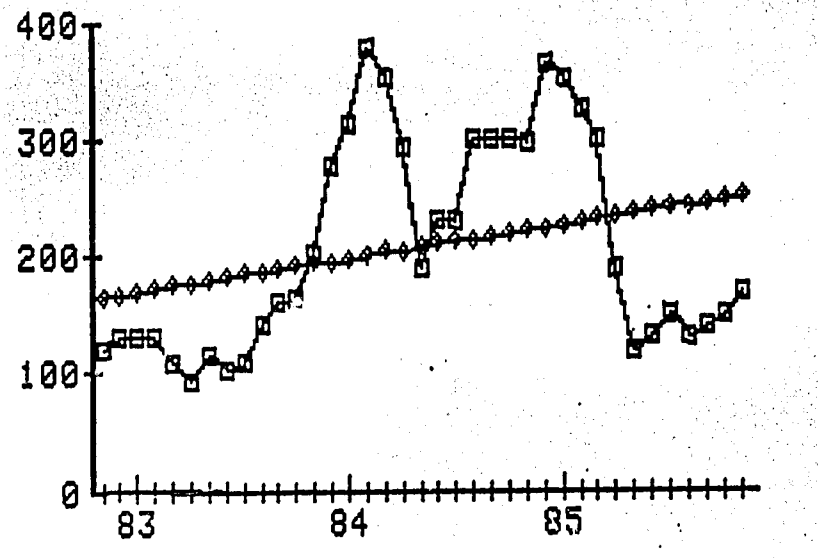
#1. Moshi Town, Kilimanjaro Region. Coffee/Banana System
Standard Deviation: 94 (High)



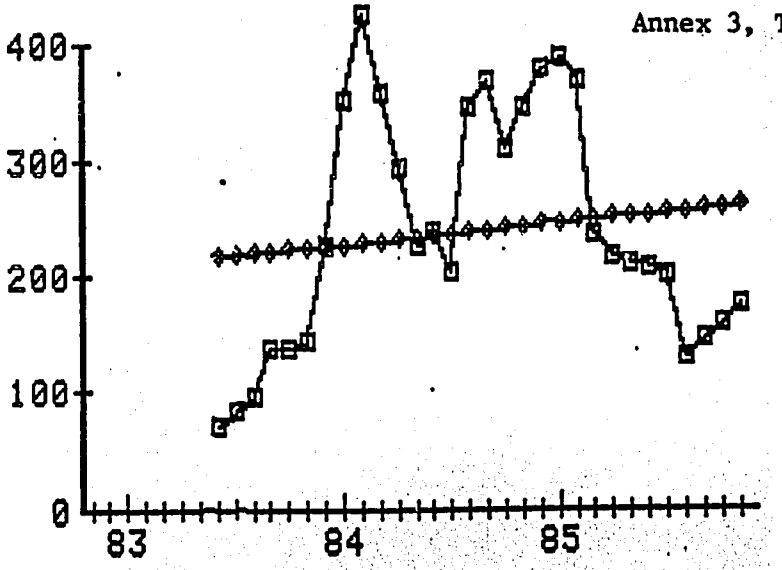
#2. Arusha (Arusha Region). Standard Deviation: 110 (High)
Pastoralist System.



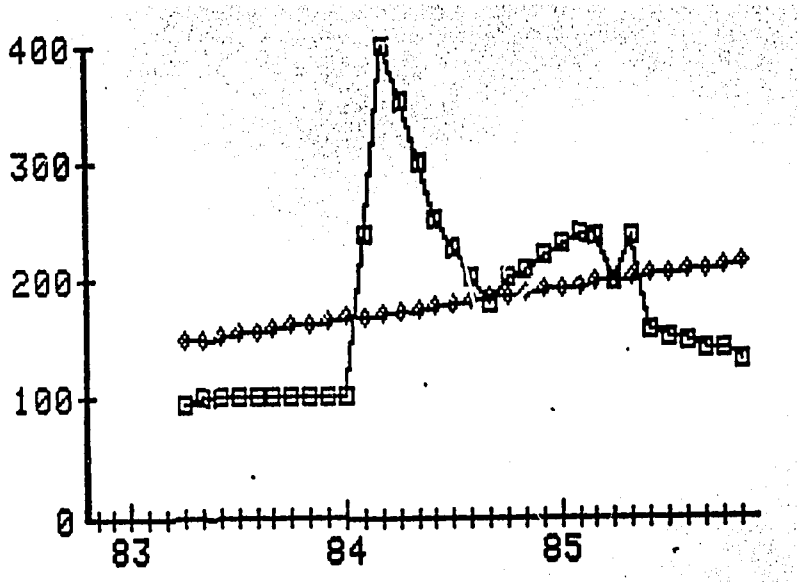
#3. Shinyanga Town, Shinyanga Region. Sorghum/Millet/Livestock System
Standard Deviation: 89 (High)



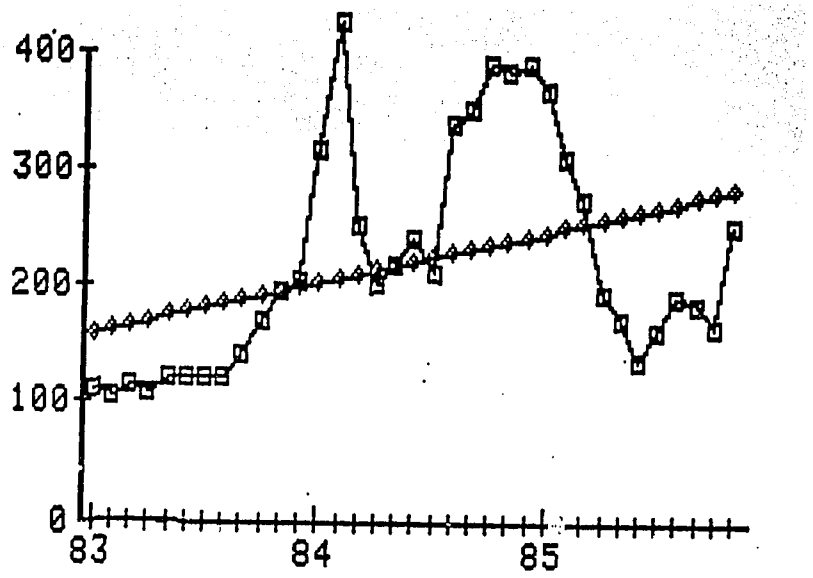
#4. Maswa Town, Shinyanga Region. Sorghum/Millet/Livestock System
Standard Deviation: 101 (High)



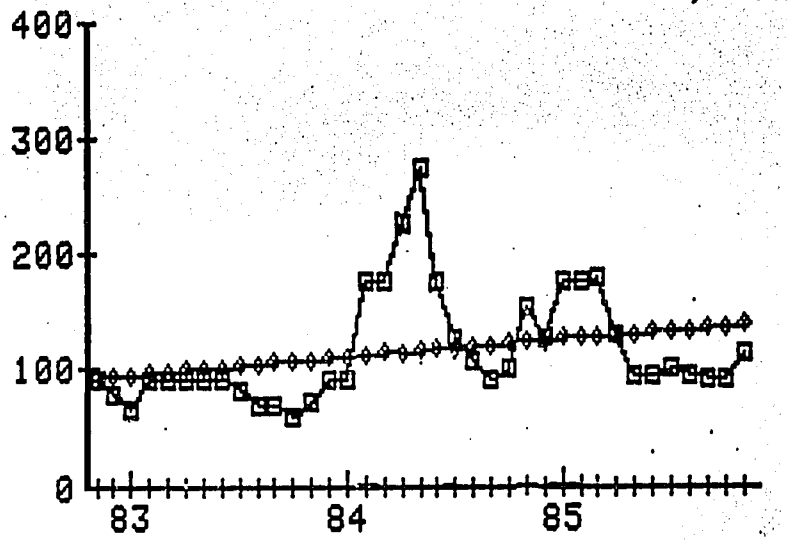
#5. Dodoma Town, Dodoma Region. Sorghum/Millet/Livestock System
Standard Deviation: 77 (Moderate)



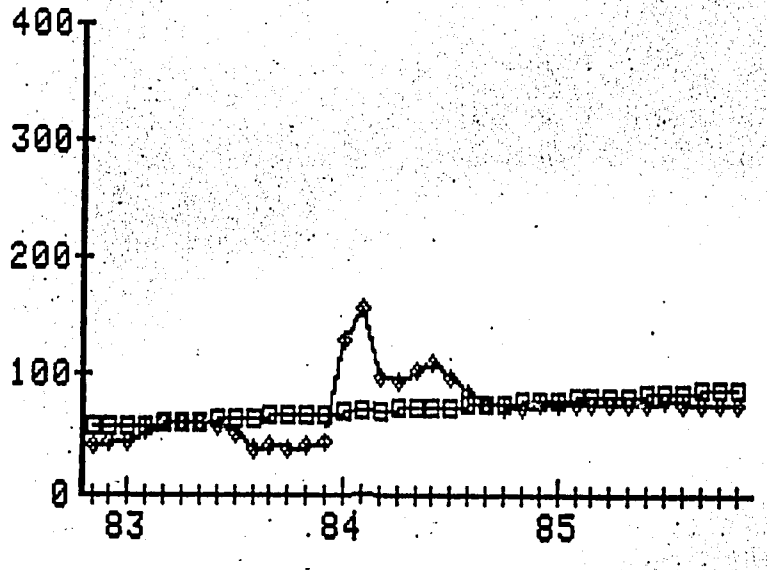
#6. Mwanza Town, Mwanza Region. Cassava System
Standard Deviation: 95 (High)



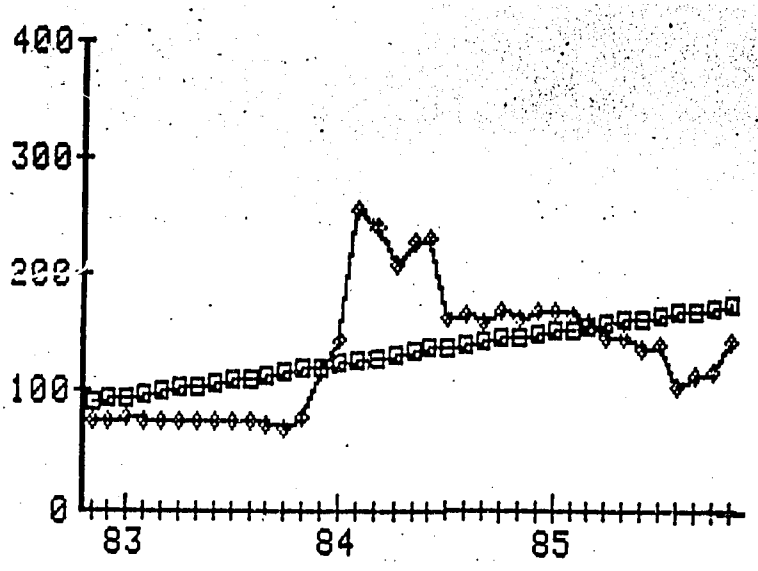
#7. Mbulu Town, Arusha Region. Maize Surplus System.
Standard Deviation: 48 (Low)



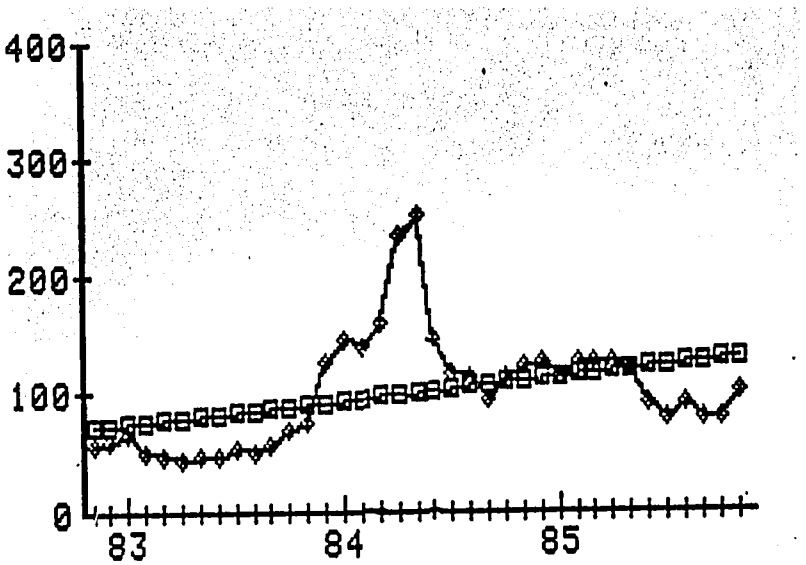
#8. Songea Town, Ruvuma Region. Maize Surplus System.
Standard Deviation: 26 (Low)



#9. Iringa Town, Iringa Region. Maize Surplus System
Standard Deviation: 53 (Moderate)



#10. Sumbawanga Town, Rukwa Region. Maize Surplus System.
Standard Deviation: 47 (Low)

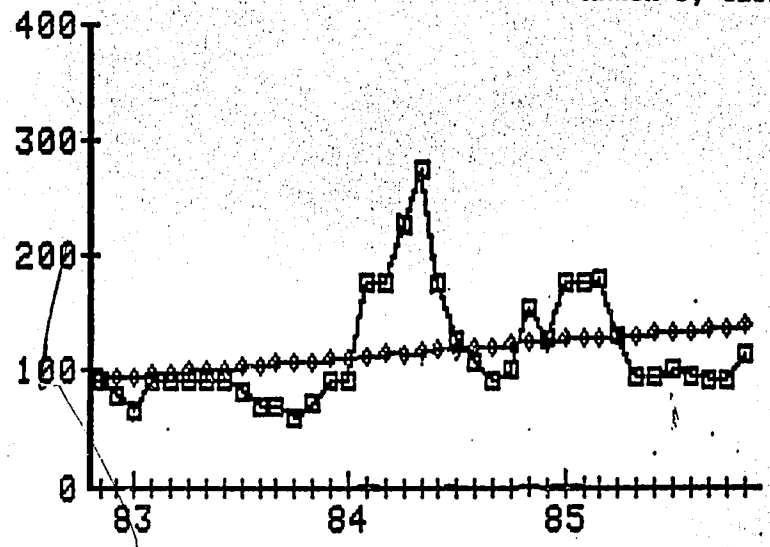


ANNEX 4

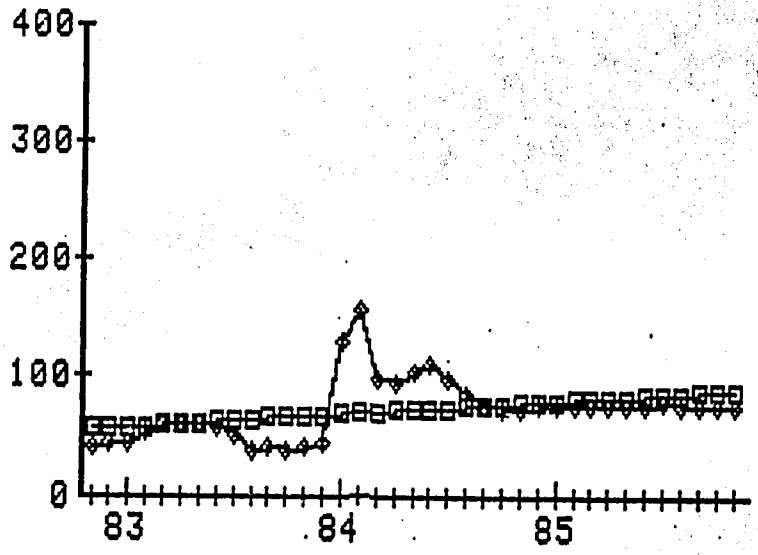
Protein - Energy Malnutrition (Weight for Age) among Under - Fives in Community Surveys in Tanzania

Principal Investigator	Year	Season	Region or District	Number of Children Surveyed	Total Underweight	Severely Underweight
Kondakis	1964		Dodoma	359	66	41
Kondakis	1964		Kilimanjaro	211	64	2
Kondakis	1964		Dar es Salaam	229	50	2
Burgess	1965		Kisarawe	603	40	not reported
Maletnlema	1967		Karagwe	399	40 - 50	not reported
Kreyster	1970	January	Lushoto	506	44	9
Kreyster	1973	April	Kilosa	1,401	37	1
Kimati	1975	December	Coast	165	60	7
Kimati	1976	May	Dar es Salaam	609	15	0.5
Kimati	1970	June	Tanga	656	8	3
Kimati	1976	December	Dodoma	303	16	5
Kimati	1977	May	Mbeya	1,505	21	3
Kimati	1977	June	Morogoro	2,811	36	7
Kimati	1977	June	Mwanza	917	35	6
Kimati	1977	June	Ruvuma	333	46	6
Kimati	1977	June	Lindi	535	56	7
Jonsson (TFNC)	1977	January	Kilosa	211	89	3
Jocobsen	1975	September	Njombe	1,358	33 - 59	not reported
Ljungquist(TFNC)	1977	October	Tarime	312	23	not reported
Ljungquist(TFNC)	1979	March	Kilombero	849	31	1
Ljungquist(TFNC)	1978	August	Njombe	900	46 - 68	2 - 6
(Muhimbili)	1979	June	Iringa	391	57	6
Ljungquist	1979	October	Iringa	1,519	43	5
Ljungquist	1980	October	Iringa	1,759	65	6
Bantje	1979	January	Rufiji	553	56 - 64	3 - 5
Bantje	1979	December	Rufiji	321	39 - 57	not reported
Bantje	1980	June	Rufiji	513	39	not reported
Bantje	1981	October	Rufiji	138	41 - 49	not reported
Kisanga (TFNC)	1980	December	Lindi	528	41	11
Kisanga (TFNC)	1981	January	Mtwara	579	50	9
Yambi (TFNC)	1982	June	Iringa	1,705	52	4
Yambi (TFNC)	1983	August	Iringa	733	45	2
JNSP	1984	Mar-June	Iringa	1,392	45	3
MCH/Afya	1981	September	10 Districts	1,493	36	7.5
JNSP	1984	Apr-June	Iringa	31,126	62	5.9
JNSP	1984	July-Sep	Iringa	32,437	47	4.7
JNSP	1984	Oct-Dec	Iringa	33,364	45	5.1
Program for Women and Children, Kagera)	1985	July August	Biharamulo Ngara	5,536 5,731	58 57	10 7

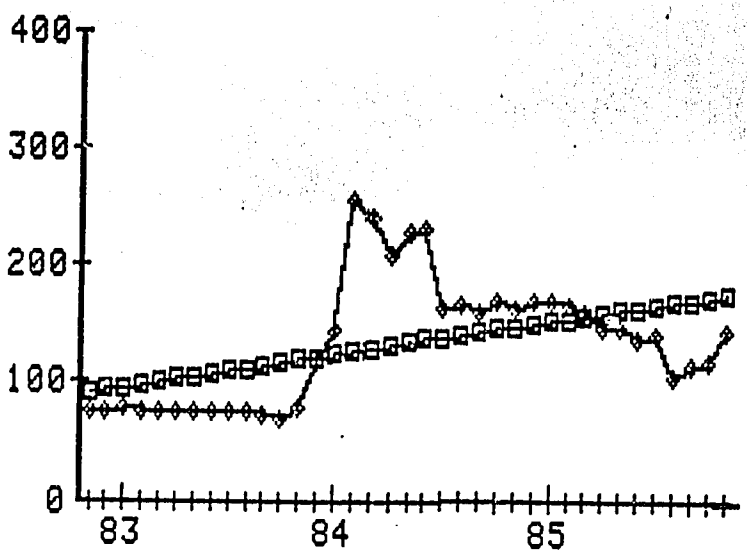
#7. Mbulu Town, Arusha Region. Maize Surplus System.
Standard Deviation: 40 (Low)



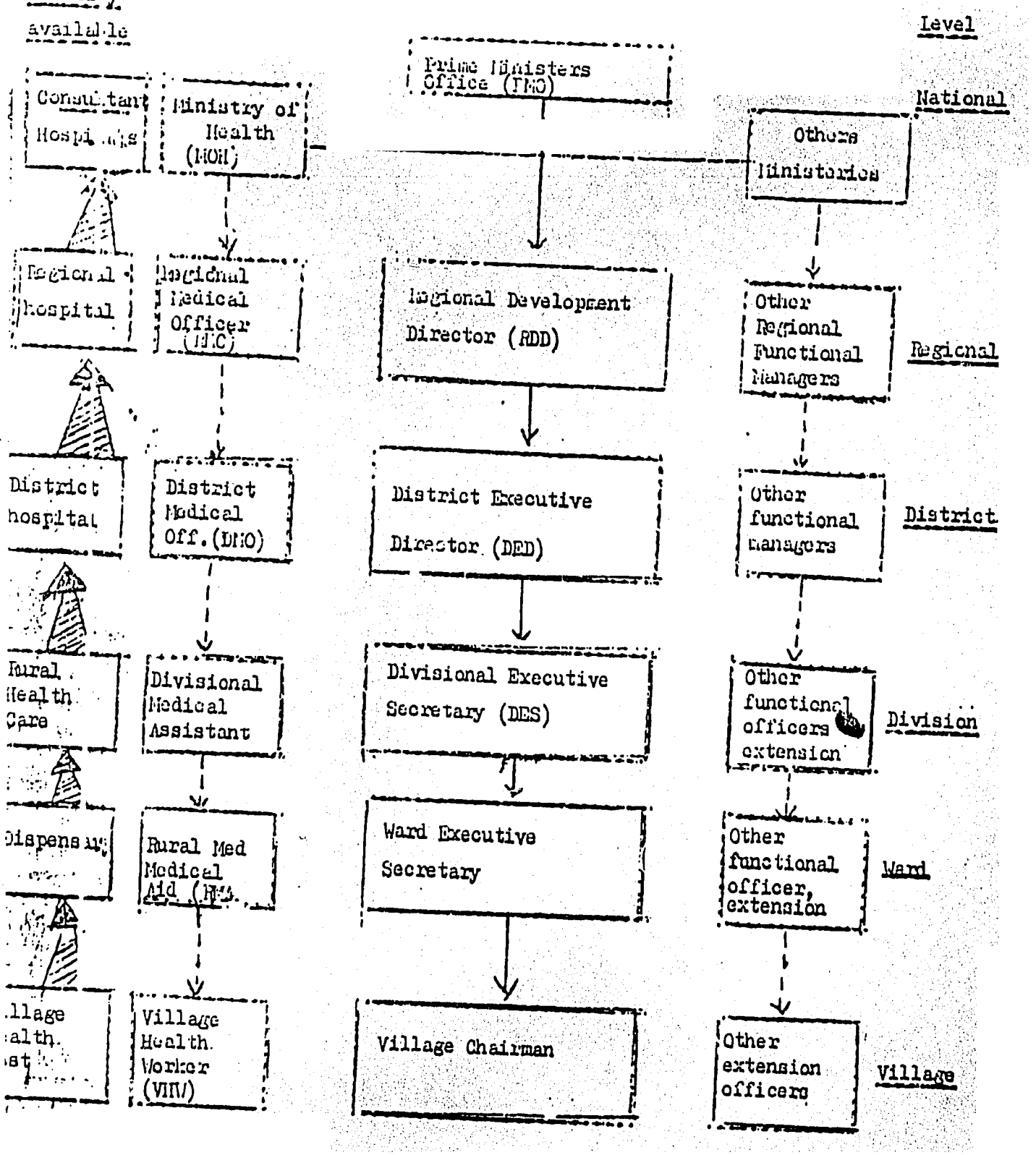
#8. Songea Town, Ruvuma Region. Maize Surplus System.
Standard Deviation: 26 (Low)



#9. Iringa Town, Iringa Region. Maize Surplus System
Standard Deviation: 53 (Moderate)



Annex 5: The formal health service infrastructure: lines of authority and responsibility



NB: Programme implementation is from the district level downwards.

Source: TFNC: A National Programme on the Control of Vitamin A Deficiency and Xeropthalmia in Tanzania. Dar es Salaam, 1985. page 7.

42

ANNEX 6

KIMEA RECIPE

A. Making Kimea (germinated cereal flour)

1. Clean and soak the chosen cereal (eg. millet, sorghum, or maize) in water.
2. Put the water-soaked cereal in a clean vessel. Put a lid on top and leave in the dark for two days (48 hours).
3. Use clean water to wash after every 12 hours to remove dew, if desired.
4. After 48 hours, dry in the sun.
5. After drying well, grind into flour and store in a clean vessel.

B. Using Kimea

1. Make a thick porridge using flour made from the common starch staple in the area, maize, millet, sorghum, cassava, or bananas. It is desirable to mix such flour with ground available legumes or nuts.
2. Let the porridge cool to a level at which it can be eaten by a child.
3. Now add a small amount of Kimea into to cooled porridge, and stir well until it liquifies. It is desirable to warm it up after this in order to make the kimea remaining in the porridge more digestable.
4. After cooling, the porridge can be fed to the child.

N.B.: It is important to cool the porridge before adding the Kimea as high heat will cause it to fail to act in reducing the porridge to liquid form.