

Nutritional Problems in AID-Assisted  
Sub-Saharan African Countries: A  
Socio-Ecological Classification  
of Target Groups

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## PREFACE

The Health/Nutrition Division of the Africa Bureau (AFR/DR/HM), USAID is preparing a position paper on nutrition as part of the formulation of a Bureau-wide nutrition strategy to deal with this pressing development problem for the Region. At the request of AFR/DR/HN, the International Nutrition Unit, under a Health Delivery Systems "RSSA" with the Office of Nutrition, AID, has prepared several background documents for this position paper.

The purpose of this background paper is to contribute additional and difficult-to-find information on the nature, magnitude and distribution of the nutrition problems as perceived by the health sector. It utilizes a classification scheme that helps organize the data in order to identify the geographic sub-regions and social groups most affected by major nutrition.

It is hoped that this paper may also assist in the identification and selection of nutrition components of health projects that contribute to multi-sectoral efforts to alleviate nutritional problems.

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Nutrition Problems in AID-Assisted Sub-Saharan  
African Countries: Towards a Socio-Ecological  
Classification of Target Groups

I. BACKGROUND

The magnitude of nutrition problems in sub-Saharan Africa is staggering, and the recent trends have been pessimistic. While estimates of the growing number and high prevalence of underfed and malnourished people differ, there is agreement that no real progress in meeting their nutritional needs was made in the past 15 years.<sup>1</sup> Declining per-capita food production and its unequal distribution that lead to rapid increases in food importation, and debilitating infectious and parasitic diseases that contribute to continued high infant and child mortality - these are just some of the obvious manifestations of the situation.

In light of the situation, the recent AID-Nutrition Sector Policy Paper recommends placing the highest priority on alleviating undernutrition through sectoral programs, primarily in agriculture and health.<sup>2</sup> This policy is to be implemented essentially through: (1) monitoring and evaluating nutrition impacts of projects, (2) targeting sectoral projects to nutritionally at-risk groups, and (3) including nutrition as a factor in program selection and project design, complemented by direct nutrition programs.

In specific reference to the health sector, the Policy Paper states that nutrition should be addressed through primary health care programs and focus in on the multiple factors that affect the health of nutritionally at-risk

groups. Among the preventive health care activities that are the focus of AID's health policy, growth monitoring and nutritional surveillance are singled out as having major nutritional significance.

At this time, AID's Africa Bureau is drafting their Nutrition Strategy whose purpose is "to provide a clear statement of the framework within which AID missions in Africa should prepare their country-specific assistance strategies for improving national nutritional status."<sup>3</sup> The health sector component of the new strategy includes approaches towards strengthening nutrition components of primary health care, institution-building, and promotion and support for research and training.<sup>4</sup> This INU paper is intended to contribute available information on the nature and magnitude of malnutrition in this region as useful background for defining health sector components of the AID Africa Nutrition Strategy.

## II. OBJECTIVES AND METHODS.

The objective of this paper is to provide information through a classification scheme that helps identify the geographic areas and social groups most affected by major nutritional problems in AID-assisted sub-Saharan African countries. In this way, it can serve both as an overview of the magnitude and extent of the most prevalent nutritional problems and help planners target vulnerable populations for nutrition interventions. Given the extreme difficulties that impede analysis of nutrition data in Africa - unrepresentative samples, low reliability, limited accessibility to existing

data, and pure non-existence of appropriate data - great caution must be taken when trying to contribute quantifiable information for policy and program purposes.

The method chosen here is a type of sub-regional classification of nutrition problems in sub-Saharan Africa that combines the numerous AID-assisted countries into five regions with somewhat similar or related political - administrative, agro-ecological, and socio-cultural characteristics. This approach is similar to that suggested by nutrition planners L. Joy and P. Payne<sup>5</sup>, utilized recently by FAO and WHO/INCAP<sup>6</sup>, and recommended in the AID Nutrition Sector Policy Paper as a useful basis for targeting. The emphasis on sub-regions tries to overcome two problems: aggregated data for Africa or even sub-Saharan Africa mask important difference among sub-regions and countries; and national nutrition surveys are too costly and rarely have sample sizes large enough to identify specific at-risk sub-groups.<sup>7</sup> Scarce resources for institution-building, training and research can often be more effectively allocated on a sub-regional basis, and appropriate data often not available for each country is more likely to be available for representative countries of a sub-region. Thus the sub-region classification approach is a compromise between sub-national and national detail and regional generalization, and can be suggestive of future avenues for national-level studies.

Four levels of nutrition-associated indicators that

interrelate numerous determinants and consequences of nutrition problems within an analytical framework are presented:

1. Nutritional status: anthropometry and specific nutrient deficiencies.
2. Health status: mortality, morbidity, fertility and sanitation.
3. Food availability: production, distribution and consumption (including breastfeeding).
4. Socio-economic status: income, education, employment

The main sources of information came from the World Health Organization, the World Bank, Food and Agriculture Organization, USDA, DHHS and AID.<sup>8</sup> The data selected was judged to be the most up-to-date, reliable, representative and appropriate available to the author.\*

Two types of regionalizations are presented. One follows closely a five zone agro-climatic scheme developed by the AID Africa Bureau for an agricultural research development initiative (CDA)<sup>9</sup>, as follows:

- A. Sahelian - Sudanic Zone (Sahelian countries from Senegal to Somalia)
- B. West Africa Coastal Zone (coastal and interior humid climate countries from Guinea to Cameroon)
- C. Congo Basin Zone (Zaire, C.A.R., Congo and Gabon)
- D. East Africa Zone (Kenya, Uganda, Rwanda, Burundi and Tanzania)
- E. South African Plateau

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\*More data for other data-poor African countries will be forthcoming shortly from WHO and FAO.

The other is a four zone scheme suggested by the Africa Bureau for use by the Office of Development Information and Utilization of the AID Bureau of Science and Technology (ST/DIU) for their Statistical Profile Series:<sup>10</sup>

- A. Central and West Africa (14 countries)
- B. Sahel (10 countries)
- C. East Africa (9 countries)
- D. South Africa (6 countries)

For statistical and presentational purposes, several small countries with populations of 500,000 or less, and Madagascar, were left out of the analyses for this paper.

The ST/DIU weighted means of the values for the countries in each of their four regions are utilized when the indicators are available for most of the countries, and regional means are meaningful. When this is not the case (anthropometry, etc.), AFR/DR/ARD's CDA regions are utilized to provide ranges and modal levels.

The geographic and agro-climatic sub-regionalization based on available data should only be the first step in the development of a "functional classification" methodology. The next step is to develop national level studies in order to classify more detailed agro-ecological zones associated with food availability and endemic disease patterns, and identify within them specific at-risk sub-groups, such as: 1 - Socio-Economic (land availability, employment status, etc.); 2 - Socio-cultural (tribal, religious, ethnic, etc.); 3 - Familial (by residential, migratory, marital and kinship status, etc.) and 4 - Life cycle (family size, pregnant and lactating,

labor force participation, child-bearing/rearing, etc.).

This approach is experimented with briefly here by a review of the literature on nutrition status correlates and regional/life cycle patterns found in available nutrition reviews for eight African countries.<sup>11</sup>

### III. RESULTS FROM AVAILABLE DATA

#### General

The paucity of reliable data makes it difficult to present accurate statements about the nature, magnitude and distribution of nutrition problems in Africa. Yet recent studies have documented the extremely high levels of infant, child and maternal mortality, and the over-riding importance of malnutrition as underlying or associated cause of death.<sup>12</sup> With respect to their important functional consequences for the socio-economic development process, the following ranking of nutrition status problems is suggested by the data:

- 1 - Protein-energy malnutrition (PEM).
- 2 - Iron-deficiency anemia.
- 3 - Vitamin A and iodine deficiencies.

These are the consequences of specific interdiate factors, among whom the two most important are:

- 1 - Insufficient and uneven distribution of food by region, class, season and age/sex.
- 2 - Communicable childhood diseases, particularly diarrheas and measles.

As noted before, broad regional generalizations mask important differences among sub-regions and countries. An

analysis of the data on the variation in the prevalence and distribution of protein-energy malnutrition, for example, should take the following into account:

- 1 - Acute or chronic prevalence.
- 2 - Seasonality of incidence.
- 3 - Life-cycle status (age/sex).
- 4 - Periodic famine and epidemics.
- 5 - Social, political and tribal upheaval.
- 6 - Historic and current health and agricultural infrastructures (including information systems).

What follows is a presentation of data by region, country and socio-ecological risk group which, while frequently not meeting all six criteria listed above, provide a better indication of sub-regional and inter/intra country differences than the more general statements made above. The first three tables are presented without sub-regional weighted means, the last two include these means crucial for inter-regional comparisons.

#### Nutritional Status

Of the 33 AID-assisted countries in sub-Saharan Africa with over 500,000 people, representative national nutrition surveys have recently been carried out in only six (Liberia, Sierra Leone, Togo, Cameroon, Lesotho and Kenya), and other large sub-national surveys in another eight, leaving our analysis without data for the remaining nineteen countries (Figure 1). Table 1 shows that weight-and height-for-age prevalence rates

of moderate-to-severe PEM for pre-school children are mostly over 20%, with rates equally as high in the sampled urban as in the rural areas. The 42% level in Kinshasa and levels between 40-60 in broad rural areas of Tanzania are among the highest recorded of chronic PEM. Preschool anemia rates show a broader range, from 25% and 38% in Lesotho and Cameroon to 52%, 59% and 62% in the Coastal W. Africa countries of Sierra Leone, Togo and Liberia, respectively. Neither the Sahel, nor the South are adequately represented in these data. There is some evidence that the extremely high rates of acute malnutrition found during the drought period of the early 1970's have been reduced,<sup>13</sup> but more nutritional status data on this hard-pressed region are needed.

Data on the related indicators of maternal and child nutrition, low birth weight\* (in 17 countries) and prevalence of breastfeeding (in 11 countries), are shown in Table 2. All the birth weight data, coming from WHO (except Sudan's), reveal most levels in the teens, from 9 and 10 percent in Guinea-Bissau and Uganda, to a high 18 percent in Guinea, Nigeria and Kenya.\*\* The level was as low as 8 percent among the urban poor in Kinshasa, and as high as 25 percent in Khartoum hospital. Data that were comparable on the prevalence of breastfeeding, reveal near universal breastfeeding up to six months. However, the few percent who are not are often at high risk, also prevalence among the poor in a few large urban areas has been declining.<sup>14</sup>

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\*Under 2.5 kg.

\*\*Levels are generally under 5% in most developed countries.

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Indicators

Demographic and Health

Several nutrition-related demographic indicators are presented in Table 3. One very important summary rate, infant mortality, is consistently very high in the Sahel, the lowest in the East, and a mixture in the other three regions (eg., quite high in Sierra Leone, Malawi and in Guinea). The average number of children per woman (total fertility rate) is very high (7-8 children) except in the Zaire River Basin and nearby areas of W. Coastal Africa, plus Chad, Burundi and Lesotho. However, traditional practices of child-spacing are breaking down, and closely-spaced higher risk pregnancies are being evidenced.<sup>15</sup>

Population dynamics at the macro level also need to be taken into account in assessing the nutrition situation. Not only does Sub-Saharan Africa have the highest rate of population growth (nearly 3%), but also the highest rates of urban growth. In column 3 of Table 3, explosive urban growth rates of over 8% (or a doubling of the city each decade) are seen in Mauritania, Ivory Coast and Tanzania, and rates over 7% in Cameroon, Zaire, Lesotho and Uganda. The rural areas of the countries are not necessarily emptying out, and "nutritional" densities as measured by agricultural land per agricultural worker are quite critical in numerous countries of East Africa (Burundi and Kenya) and also in Malawi and Liberia.

We turn now to the nutrition-related indicators with weighted sub-regional means in Tables 4 and 5. The child mortality rate (ages 1-4) is one of the best indirect

nutritional status indicators for Africa, since growth retardation does not become that marked until near the end of the first year of life. The Sahel has by far the highest child mortality rate (31 per thousand), followed by Central/West (23), East (21) and South (20) (see figure 2). If Somalia (30) and Sudan (29) were removed from the East, then East Africa would have the lowest rates. Liberia (16) and Zimbabwe (15) have the lowest rates in their respective areas.

The sub-regional levels of child mortality are associated with levels of access to safe water and excreta disposal. The Sahel has very low access levels (22 and 7 percent, respectively) while the East and South have somewhat higher levels (34 and 40, 36 and 27, respectively). The anomaly is in the Central/West where the percent of households with access to excreta disposal is up to 32: in three countries over half of the households have access ((Central African Republic (72), Rwanda (57) and Ghana (56)), and in four other less than 15% have access ((Togo (15), Benin (14), Liberia (11), Congo (9) )).

#### Food Availability

FAO provides three-year estimates of food availability for almost every country of the world.<sup>16</sup> Table 5 presents two such indicators, daily calorie supply per capita, and supply as percentage of the FAO/WHO recommended daily calorie requirements.<sup>\*</sup> The sub-region with the highest daily calorie supply per

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\* These take into consideration country variations in age/sex distributions and climatic conditions.

capita in 1977-79 was Central/West (2240),\*\* followed by East (2195), South (2118) and the Sahel (2049). In the 1975-77 period, the South had a similar supply (2287) to the Central/West (2266). As a percent of requirements, none of the regions reached 100%, with only the Central/West approaching that level (97-98%) (See figure 3). The Sahel was far behind at 87 percent. The most severe situation recorded was in Chad for the 1975-77 period, meeting only 75% of requirements, even under unrealistic assumptions of equal socio-economic distribution. According to World Bank estimates for 1973 on calorie intake and requirements, and matching it with each country's income distribution, much greater proportions of the population were assumed to be consuming less than the FAO/WHO recommended calories:<sup>17</sup> 90% in Chad, 77 in Tanzania, 69 in Sudan, 67 in Kenya, 66 in Zambia, and 65 in Senegal.

As with national nutrition surveys, there is also the need for periodic household food production, expenditure and consumption surveys. In the meantime, one has to rely on indirect indicators and hypothetical assumptions to assess needs as a basis for nutrition planning and evaluation.

#### IV. DISCUSSION: TOWARDS SOCIO-ECOLOGICAL TARGETING

The results suggest that, in general, there are very high levels of the direct and indirect indicators of malnutrition in Sub-Saharan Africa as compared to the rest

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\*\* Unfortunately here, the nutritional quality of the diet, based heavily on cassava, is poor.

of the world. There are also entire sub-regions, such as the Sahel, and specific countries in the other regions, depending on the indicator, that seriously need direct assistance in addressing their nutrition problems. Unfortunately the more direct anthropometric and food consumption indicators of malnutrition are among the least representative and reliable of the nutrition-related indicators.

*in what sense?*

In searching for schemes other than geographic regionalization to classify countries with different nutrition problems, one could use such development indicators as Gross National Product Per Capita, a Poverty Index or Adult Literacy (Table 6). Matching these three indicators by one of the more reliable indirect indicators of malnutrition (child mortality), little association is observed (See figure 4). Relatively higher income countries such as Congo, Cameroon, Senegal, and Sudan have high child mortality rates not unlike those recorded in the lowest income countries of Burundi, Chad, Mali, Niger and Upper Volta. On the other hand, the expected higher child mortality rates in some of the poorer countries, such as in Tanzania, Kenya, Lesotho, Uganda and Ghana, are not found. Better levels of the social indicators of rural poverty and/or adult illiteracy seem to attenuate the direct income-mortality relationship.

In view of these difficulties with sub-regional and even national-level generalizations, an attempt was made to find data that classified intra-country nutrition problems by agro-ecological zones and socioeconomic groups. One good study was located in the 1979-83 Development Plan of

Kenya and based on the Report of the Child Nutrition Survey 1978/79.<sup>18</sup> It presented anthropometric data by eleven agricultural/ecological zones in the country (Table 7), identified nutritionally deficient groups and their estimated number, the nature and cause of their nutrition problem, and suggested policies to alleviate the problem (Table 8).

In view of the absence of other similar studies, we did a quick literature review of the various policy-relevant correlates of malnutrition found in recent studies in Sub-Saharan Africa.<sup>19</sup> The findings were then classified into four categories: geographic-ecological; agricultural-occupational; sociological-cultural and biological-demographic. These categories include both geographic areas and social groups and certain characteristics that are associated with their vulnerability:

1. Geo-Ecological - Mountainous areas  
Border areas with political problems  
Slum areas of largest cities  
Areas most affected by wet season - pre harvest scarcity & disease  
Endemic malaria, schistosomiasis and oncho. areas  
Refugee areas  
Areas of unpredictable drought

- 2. Agro-Occupational- Migrant workers, temporary plantation workers  
Landless laborers  
Farmers with less than 2 acres of land  
Small cash crop farmers  
Low income, wealth levels  
Formally employed lower class women
  
- 3. Socio-Cultural - Family instability  
Tribal change  
Rapid urbanization  
Low female status  
Unmarried, separated or divorced women  
(women headed households)  
Illiterate mothers  
Alcoholism
  
- 4. Demographic - High birth order children  
Very young mothers, old mothers  
Close birthspacing

These, then, are examples of target groups that governments need to identify, quantify and locate in order to plan programs and direct interventions at those most in need and who can benefit the most.

## V. CONCLUSIONS AND RECOMMENDATIONS

This paper attempts to provide information on the nutrition situation in sub-Saharan Africa in a useful way so that the AID Africa Bureau's Health and Nutrition Division can incorporate it into the development of their nutrition position paper. In general, it can be concluded that while data on the overall nutrition situation in sub-Saharan Africa reveal generally pessimistic outlook, these averages mask important differences between sub-regions, between countries within a sub-region, and among population groups and ecological areas within a country. However, data available on nutrition status and real food consumption indicators in AID-assisted countries in sub-Saharan Africa are not adequate or reliable enough to draw firm inter-regional and inter-country conclusions.

Indirect nutrition-related indicators are the best that can be used at the present time. Analyses of these data and related literature suggest the following:

1. The Sahel-Sudanic sub-region continues to present the most serious problems of protein-energy malnutrition, followed by West Africa Coastal and Zaire River Basin. Low birth-weight is prevalent in most countries of the region.

2. While the East and South Africa regions are relatively better-off nutritionally, certain countries, such as Burundi and Malawi, and certain large areas of these countries, such as central Tanzania, are not.

3. Social groups whose children are highly vulnerable to moderate and severe malnutrition include: landless rural laborers, nomadic herdsman, urban underemployed, marginal subsistence farmers, migrant plantation workers.

4. Political, social, cultural and ecological change are producing conditions that can negatively affect the nutritional situation: rapid urbanization, rising arable land/man ratios, refugee status, family structure and sex roles in transition, temporary labor migration, changes in tastes and preferences for imported food, expansion of modern curative services at expense of preventive and traditional health care, among others.

5. While broad generalizations are difficult to make, certain nutrient deficiencies, such as vitamin A, iron and iodine, are significant public health problems in many areas and need to be addressed on a country basis.

6. Certain diseases are also quite prevalent in many areas of Africa and particularly lethal to the malnourished child and debilitating to the underfed adult, such as measles, malaria, diarrheas and onchocerciasis.

7. Maternal malnutrition and low birth-weight are prevalent in all reporting areas, while short duration of breastfeeding is not, evidenced mainly in certain zones of the largest cities.

#### Recommendations

Here is a short list of recommendations to improve nutrition problem identification and targeting for implementation by the AID Africa Bureau in collaboration with other AID bureaus and international development agencies:

1. Improve nutrition information generation within projects.

Most Africa Bureau health, nutrition and agriculture projects should include information systems that help in

monitoring, evaluation and surveillance of the nutrition situation. Assessments and baseline surveys should incorporate nutrition indicators, and health and nutrition projects should expand individualized growth monitoring activities into more aggregated social group, community and administrative district level nutritional surveillance systems.

New regional projects such as Combatting Childhood Communicable Diseases (CCCD) should incorporate nutrition indicators into their information system component. PID and PP teams must improve the nutrition data base upon which project design decisions for incorporating nutrition activities and components are made. Guidelines, such as those being drawn up by the Office of Nutrition's DHHS and USDA RSSA teams, should be utilized.

2. Increase Relevance of Research.

Operational and health services research is needed that is low cost and appropriate. For example, what nutrition indicators are needed, how the data are to be collected, tabulated and analyzed, by whom, and what use is going to be made of the information? What is the process like of becoming malnourished? Which nutrition interventions have been effective? Because sub-regions or small groups of countries share common nutrition problems, it would seem to be more cost-effective to support networks of sub-regional food, nutrition and health research institutes and centers. A few selected countries could support national nutrition research and training centers, and each country should have

at least a committee. More countries should do national nutrition surveys, but lower cost, less complicated, more quickly and locally analyzed data methods are needed.

3. In-House Bureau Information Dissemination.

The Africa Bureau Nutrition Advisor could be responsible for coordinating efforts to provide timely and pertinent information for strategy, program and project development and evaluation. The advisor should utilize centrally-funded resources, contractors, and universities, and see to it that missions and special country teams (PID, PP, Evaluation, etc.) help to continuously update the information. This updated information should be incorporated into the yearly Country Development Strategy Statements (CDSS).

NUTRITION STATUS INDICATORS OF PRESCHOOL CHILDREN IN MOST  
RECENT REPRESENTATIVE SAMPLES, BY COUNTRY, SUB-SAHARAN AFRICA

REGION, COUNTRY AND YEAR OF SURVEY	Weight For Age (% under 80% of Reference)	Height for Age (% under 90% of Reference)	Anemia (% under 11 gm.)
<u>SAHEL - SUDANIC</u>			
CHAD	-	-	-
GAMBIA	-	-	-
MALI	-	-	-
MAURITANIA	-	-	-
NIGER (1976)	20 (Rural)	-	-
SENEGAL (1981)	22 (Rural)	-	-
SOMALIA	-	-	-
SUDAN (1972)/(n.d.)	18* (Rural)/22* (Urb.)	±18	-
UPPER VOLTA	-	-	-
<u>W. AFRICA - COASTAL</u>			
BENIN	-	-	-
CAMEROON (1978)	21	22	38
GHANA (1973-74)	25-33	-	-
GUINEA	-	-	-
GUINEA-B.	-**	-	-
IVORY COAST	34	-	-
LIBERIA (1976)	24	19	62
NIGERIA	-	-	-
SIERRA LEONE (1978)	30	24	52
TOGO (1976)	-22	18	59
<u>ZAIRE RIVER BASIN</u>			
C.A.R.	-	-	-
CONGO	34 (Rural)	-	-
ZAIRE (1977)	30-45 (Rural)	-	-
(1979)	42 (Urban)	-	-
<u>EAST</u>			
BURUNDI	-	-	-
KENYA (1978-9)	33	29	-
RWANDA	-	-	-
TANZANIA (1977)	31 (National)	-	-
UGANDA	40-60 (Rural)	-	-
<u>SOUTH</u>			
BOTSWANA	-	-	-
LESOTHO (1977)	22	23	25
MALAWI	-	-	-
SWAZILAND	-	-	-
ZAMBIA	-	25	-
ZIMBABWE	-	-	-

Note: A hyphen (-) means that no national or sub-national representative and relatively reliable and recent data were available.

(Table 1 cont.)

\*Gomez Classification (% under 75 of reference).

\*\*Children 1½-2½ years old.

Sources: Cameroon, Liberia, Sierra Leone, Togo, and Lesotho, National Nutrition Surveys, USAID, 1976-78; Senegal: clinic weighings in Fatich District, G. Berggren, 1981; Sudan: the Gezira (rural), Khartoum (urban), Taha, 1979; Ghana: CRS clinics (Austin, 1981); Ivory Coast: Abidjan, UNU, 1980; Zaire: West Zaire (rural), Niger: Maradi Dept., MOH, 1976. Congo: Linzolo area and Ngabe District, WHO, 1977, 1979; Kenya: CBS, 1975-1979; Tanzania: National (Kimati, 1977); rural (Gwatkin, 1982).

Table 2  
NUTRITION-RELATED INDICATORS IN REPRESENTATIVE SAMPLES  
BY COUNTRY, SUB-SAHARAN AFRICA

REGION & COUNTRY	Low Birth Weight (<2.5 Kg) (%)	Prevalence of Breastfeed at 6 Months (%)
<u>SAHEL - SUDANIC</u>		
CHAD	-	-
GAMBIA	-	-
MALI	-	-
MAURITANIA	-	-
NIGER	-	-
SENEGAL	10	99(Sine-Niakhar area)
SOMALIA	-	-
SUDAN	25(Khartoum)	95(Gezira)
UPPER VOLTA	-	-
<u>W. AFRICA - COASTAL</u>		
BENIN	-	-
CAMEROON	11	98
GHANA	14	94
GUINEA	18	-
GUINEA-B.	9	-
IVORY COAST	14	-
LIBERIA	-	94
NIGERIA	18	97(urban poor);100(ru
SIERRA LEONE	-	98
TOGO	-	100
<u>ZAIRE RIVER BASIN</u>		
C.A.R.	-	-
CONGO	-	-
ZAIRE	18(rural) 8(urban poor)	100
<u>EAST</u>		
BURUNDI	14	-
KENYA	18	-
RWANDA	17	-
TANZANIA	14-16	99
UGAWDA	10	-
<u>SOUTH</u>		
BOTSWANA	-	-
LESOTHO	15	98(rural)
MALAWI	-	-
SWAZILAND	-	-
ZAMBIA	14	-
ZIMBABWE	15	-

Sources: (see next page)

(Table 2 cont.)

Sources: Low birth weight - WHO, 1980 except Sudan: Khartoum, Karrar-Osman, 1979; and Tanzania: Kimati, 1981; Breastfeeding - AID-sponsored surveys in Cameroon, Liberia, Sierra Leone, and Togo, 1976-1978; Senegal, Cantrelle and Leridon, 1971; Sudan; Taha, 1979, Ghana: Davey, 1961; Nigeria: WHO, 1980; Zaire: WHO, 1980; Tanzania: Kimati, 1981; and Lesotho, GOL, 1976.

NUTRITION-RELATED DEMOGRAPHIC INDICATORS BY  
SUB-SAHARAN COUNTRY\* (c. 1980)

REGION & COUNTRY	Infant Mortality (Rate/1000)	Total Fertility (Rate/Woman)	Urban Growth, '70-'80 (Yr. Rate/1000)	Agri. Pbp. Det sity (Agri. La Per Agri. Worl (ha.
<u>SAHEL - SUDANIC</u>				
CHAD	149	5.9	6.7	-
GAMBIA	198	6.4	-	2.7
MALI	154	7.0	5.5	10.7
MAURITANIA	143	6.9	8.6	99.1
NIGER	146	7.1	6.8	8.9
SENEGAL	147	7.1	3.3	4.8
SOMALIA	147	6.1	5.1	27.5
SUDAN	124	6.6	6.8	7.5
UPPER VOLTA	211	6.5	4.1	6.7
<u>W. AFRICA - COASTAL</u>				
BENIN	154	6.7	3.9	-
CAMEROON	109	5.7	7.5	5.1
GHANA	103	6.7	5.2	6.3
GUINEA	165	6.2	6.1	4.1
GUINEA-B.	149	5.4	-	10.9
IVORY COAST	127	6.7	8.2	-
LIBERIA	154	6.9	5.6	1.3
NIGERIA	135	6.9	4.9	-
SIERRA LEONE	208	6.2	5.6	3.3
TOGO	109	6.5	5.6	2.2
<u>ZAIRE RIVER BASIN</u>				
C.A.R.	149	5.9	4.9	5.8
CONGO	129	6.0	3.2	82.7
ZAIRE	112	6.0	7.2	3.2
<u>EAST</u>				
BURUNDI	122	5.9	2.6	0.9
KENYA	87	8.1	6.8	1.3
RWANDA	107	7.0	5.9	0.7
TANZANIA	103	6.6	8.3	8.7
UGANDA	97	6.2	7.0	2.5
<u>SOUTH</u>				
BOTSWANA	83	6.5	-	151.2
LESOTHO	115	5.9	7.8	4.0
MALAWI	172	7.0	6.2	1.9
SWAZILAND	135	6.5	-	7.8
ZAMBIA	106	7.0	5.4	126.5
ZIMBABWE	74	6.7	6.4	5.3

\*Only AID-assisted countries with over 500,000 population included.  
Sources: World Bank, World Development Report, 1980, Population  
Reference Bureau, World's Child Data Sheet 1982. ATN

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Table 4

SELECTED NUTRITION-RELATED HEALTH INDICATORS (late 1970's)  
BY COUNTRY\* & WEIGHTED REGIONAL MEANS

REGION & COUNTRY	Child Mortality Rate	Access to Safe Water (%)	Access to Excr Disposal (%)
<u>CENTRAL &amp; WEST</u>	<u>23</u>	<u>20</u>	<u>32</u>
BENIN	25	21	14
BURUNDI	33	2	-
CAMEROON	25	26	-
C.A.R.	30	16	72
CONGO	27	17	9
GHANA	22	35	56
LIBERIA	16	20	11
NIGERIA	22	20	-
RWANDA	25	35	57
SIERRA LEONE	25	12	-
TOGO	25	16	15
ZAIRE	25	16	22
<u>SAHEL</u>	<u>31</u>	<u>22</u>	<u>7</u>
CHAD	35	26	1
GAMBIA	-	12	-
GUINEA	28	10	13
GUINEA-B.	-	11	-
MALI	31	9	8
MAURITANIA	29	17	-
NIGER	31	27	7
SENEGAL	31	37	-
UPPER VOLTA	31	25	4
<u>EAST</u>	<u>21</u>	<u>34</u>	<u>40</u>
KENYA	15	17	55
SOMALIA	30	33	47
SUDAN	29	46	22
TANZANIA	18	39	17
UGANDA	16	35	94
<u>SOUTH</u>	<u>20</u>	<u>36</u>	<u>27</u>
BOTSWANA	-	45	-
LESOTHO	20	17	13
MALAWI	25	33	15
SWAZILAND	-	37	36
ZAMBIA	22	42	42
ZIMBABWE	15	-	-

\*Only AID-assisted countries with over 500,000 population included.

Source: World Bank, World Development Report, 1981; and AID, ST/DIU, 1982.

Table 5

FOOD SUPPLY BY COUNTRY<sup>a</sup> & WEIGHTED REGIONAL MEANS\*\*

REGION & COUNTRY	Daily Calorie Supply, 1977-79 Per Capita	Percent of Requirements
<u>CENTRAL &amp; WEST</u>	<u>2240(2266)*</u>	<u>96.6(97.9)*</u>
BENIN	2153*	93.6*
BURUNDI	2260*	97.0*
CAMEROON	2442	105.3
C.A.R.	2143	94.8
CONGO	2234*	100.6
GHANA	1996	86.8
LIBERIA	2396	103.7
NIGERIA	2295	97.2
RWANDA	2191	94.4
SIERRA LEONE	2082	90.5
TOGO	2035*	88.5*
ZAIRE	2156	97.1
<u>SAHEL</u>	<u>2049(2034)*</u>	<u>87.0(86.4)*</u>
CHAD	1793*	75.3*
GAMBIA	2281*	95.8*
GUINEA	1921*	83.2*
GUINEA-B.	2340	101.3
MALI	2114*	90.0*
MAURITANIA	1951	84.5
NIGER	2051*	87.3*
SENEGAL	2228*	93.6*
UPPER VOLTA	2024	85.4
<u>EAST</u>	<u>2195(2168)*</u>	<u>94.6(93.4)*</u>
KENYA	2085	89.9
SOMALIA	2173	94.1
SUDAN	2339	99.5
TANZANIA	2040	87.9
UGANDA	2070*	88.8*
<u>SOUTH</u>	<u>2118(2287)*</u>	<u>91.5(93.2)*</u>
BOTSWANA	2070*	89.2*
LESOTHO	2138*	93.8*
MALAWI	2238	96.5
SWAZILAND	2281*	98.3*
ZAMBIA	1986	86.0
ZIMBABWE	2545*	-

<sup>a</sup>(Only AID-assisted countries with over 500,000 population included)

\*Data for 1975-1977; includes fish;

\*\*Includes data from the very small countries not shown in this table.

Sources: FAO Production Yearbook, 1979 and 1980; and AID ST/DIU, 1982.

Table 6

SELECTED NUTRITION RELATED DEVELOPMENT INDICATORS (c. 1980)  
BY COUNTRY\* & WEIGHTED REGIONAL MEANS

REGION & COUNTRY	GNP Per Capita (US\$)	% Rural Pop. in Poverty	% Adult Illiteracy
<u>CENTRAL &amp; WEST</u>	<u>632</u>	<u>65</u>	<u>78</u>
BENIN	300	65	89
BURUNDI	200	85	75
CAMEROON	670	40	88
C..A.R.	300	-	88
CONGO	730	-	86
GHANA	420	-	70
LIBERIA	520	-	70
NIGERIA	1010	-	75
RWANDA	200	90	77
SIERRA LEONE	270	65	85
TOGO	410	-	84
ZAIRE	220	-	85
<u>SAHEL</u>	<u>262</u>	<u>46</u>	<u>90</u>
CHAD	120	56	85
GAMBIA	250	40	90
GUINEA	290	-	90
GUINEA-B.	160	-	93
MALI	190	48	90
MAURITANIA	320	-	83
NIGER	330	35	92
SENEGAL	450	-	90
UPPER VOLTA	190	-	95
<u>EAST</u>	<u>371</u>	<u>64</u>	<u>60</u>
KENYA	420	55	60
SOMALIA	-	70	40
SUDAN	470	85	80
TANZANIA	260	60	34
UGANDA	280	-	80
<u>SOUTH</u>	<u>497</u>	<u>76</u>	<u>63</u>
BOTSWANA	910	55	65
LESOTHO	390	55	45
MALAWI	230	85	75
SWAZILAND	680	50	35
ZAMBIA	560	-	61
ZIMBABWE	630	-	61

\*Only AID-assisted countries with over 500,000 population included.

Sources: World Bank, World Atlas, 1981, Social Industry Data Sheets, 1981  
World Development Report, 1981; UNESCO, Statistical Yearbook, 1981.

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Table 7

## AGRO-ECOLOGICAL DISTRIBUTION OF MALNUTRITION: KENYA

ECOLOGICAL ZONES SUMMARY

AGRICULTURAL/ ECOLOGICAL ZONE	n	MEANS AND (STANDARD DEVIATIONS)			PER CENT CHILDREN WITH		PER CENT OF ALL CHILDREN WITH HA BELOW 90
		WA	HA	WH	HA BELOW 90	WE BELOW 85	
1 TEA WEST OF RIFT VALLEY	174	86.6 (11.6)	94.3 (5.7)	94.7 (10.0)	21	4	9
2 COFFEE WEST OF RIFT VALLEY	201	87.1 (12.2)	94.5 (5.6)	95.1 (9.4)	31	6	11
3 UPPER COTTON WEST OF RIFT VALLEY	246	89.4 (14.2)	93.2 (5.8)	96.4 (10.4)	32	3	19
4 TEA EAST OF RIFT VALLEY	93	83.9 (11.2)	93.0 (5.6)	93.7 (8.6)	25	3	6
5 COFFEE EAST OF RIFT VALLEY	202	83.2 (9.3)	92.0 (5.0)	95.2 (9.0)	35	3	18
6 UPPER COTTON EAST OF RIFT VALLEY	60	86.9 (13.9)	95.7 (8.2)	93.1 (9.6)	28	8	4
7 LOWER COTTON EAST OF RIFT VALLEY	152	81.3 (11.9)	90.9 (6.4)	94.3 (11.0)	44	6	17
8 HIGH ALTITUDE GRASSLANDS	114	86.0 (12.9)	92.0 (5.8)	98.4 (19.6)	40	3	12
10, 11 COASTAL ZONES	81	88.7 (13.4)	95.3 (5.1)	95.2 (10.3)	20	9	4

Source: CBS, Report of the Child Nutrition Survey 1978/79,  
p. I.1-8.

Table 8

NUTRITION PROBLEMS IN KENYA, 1978<sup>1</sup>

Nutritionally Deficient Group	Nutrition Problem	Cause of Problem	Policies to Alleviate Problem	Estimated Numbers in Group
1. SMALLHOLDERS— (a) Food crop producers average household income KES0 (1975) virtually no sales.	Protein energy malnutrition (PEM).	Insufficient food production ..	Availability of improved inputs, hybrid maize, legume and pulse production.	2,200,000
(b) Landless poor .. .. .	PEM .. .. .	Low income, consumer prices ..	Increased non-agricultural employment, public works, control of essential food prices.	410,000
(c) Cash crop producers household income K£125 (1975).	Periodic PEM .. .. .	Low earnings with poor distribution throughout the year. ..	Improved marketing, storage, stimulation of food production.	1,090,000
2. URBAN GROUPS— Unemployed, underemployed ..	PEM .. .. .	Low income, consumer prices ..	Better employment opportunities, control of essential food prices.	250,000
3. PASTORALISTS .. .. .	Periodic PEM .. .. .	Vulnerability to weather, lack of food security.	Food security systems, better stocking practices, increased demand for produce.	670,000
4. SPECIAL GROUPS <sup>2</sup> (a) Pre-school children .. .. .	30% mild PEM, 5% severe PEM..	Inadequate household purchasing power, poor feeding practices, infection.	Pre-school feeding programmes nutrition education more curative facilities.	
(b) Pregnant and lactating mothers.	Anaemia .. .. .	Poor diet, malabsorption infection, hookworms.	Feeding programmes, education, improved water supply.	
(c) Xerophthalmia bitot spots ..	Vitamin A deficiency .. ..	Poor diet, malabsorption.. ..	Increased availability of fruits and vegetables, improved water supply.	
(d) Goitre .. .. .	Iodine deficiency.	Endemic particularly in Western, Nyanza and Rift Valley.	Iodisation of salt.	

<sup>1</sup> This is not a comprehensive analysis but is indicative of the situation.

<sup>2</sup> There are many other nutrition and nutritionally related problems which tend to be either more local or not as pervasive as those listed but would be included in a more comprehensive study.

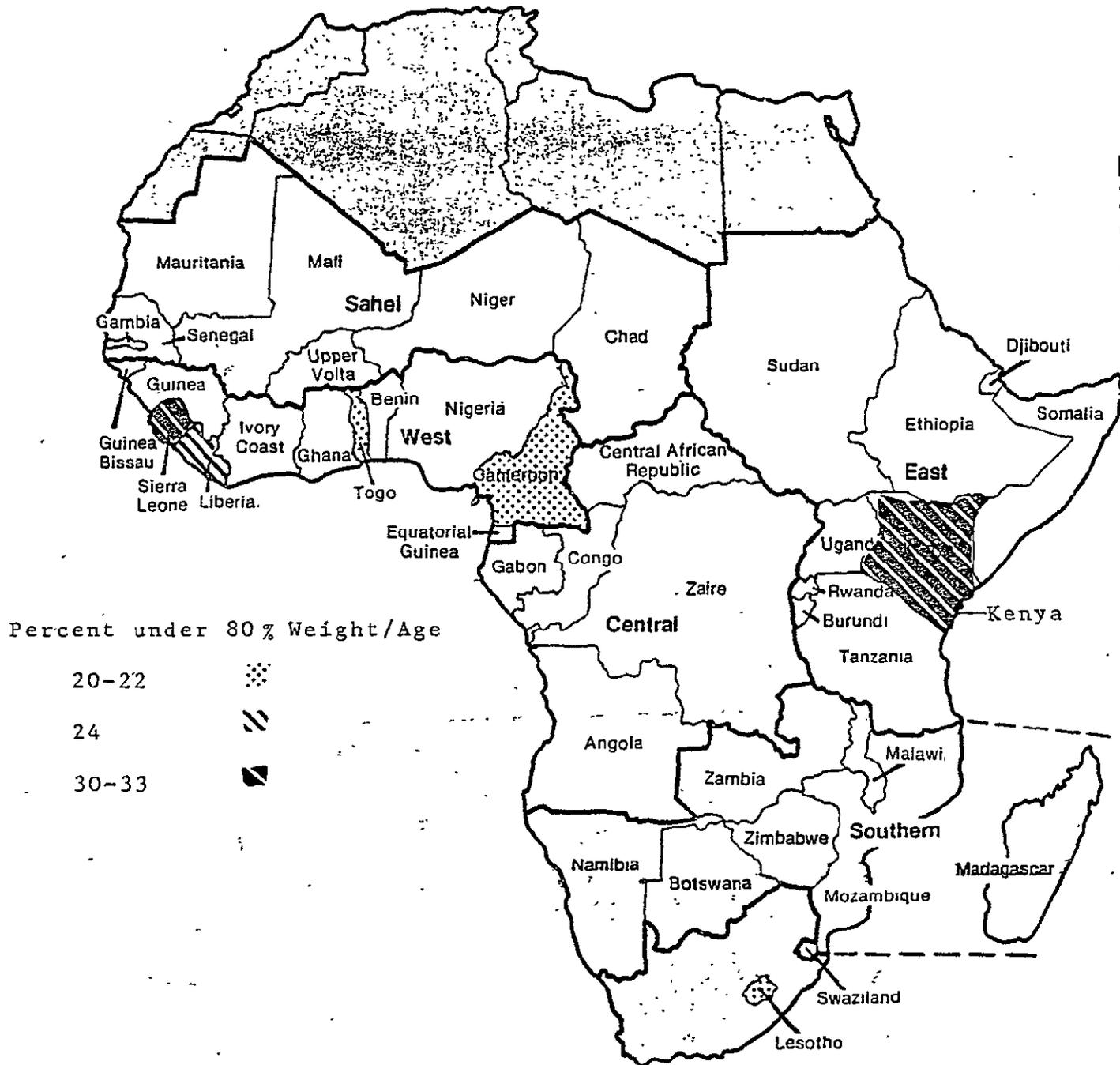
<sup>3</sup> Estimates are not given as many overlap those in groups given above.

Source: Government of Kenya, Development Plan 1979-1983. part I, p. 151.

FIGURE I

PREVALENCE OF MODERATE-SEVERE MALNUTRITION, SIX NATIONAL SURVEYS

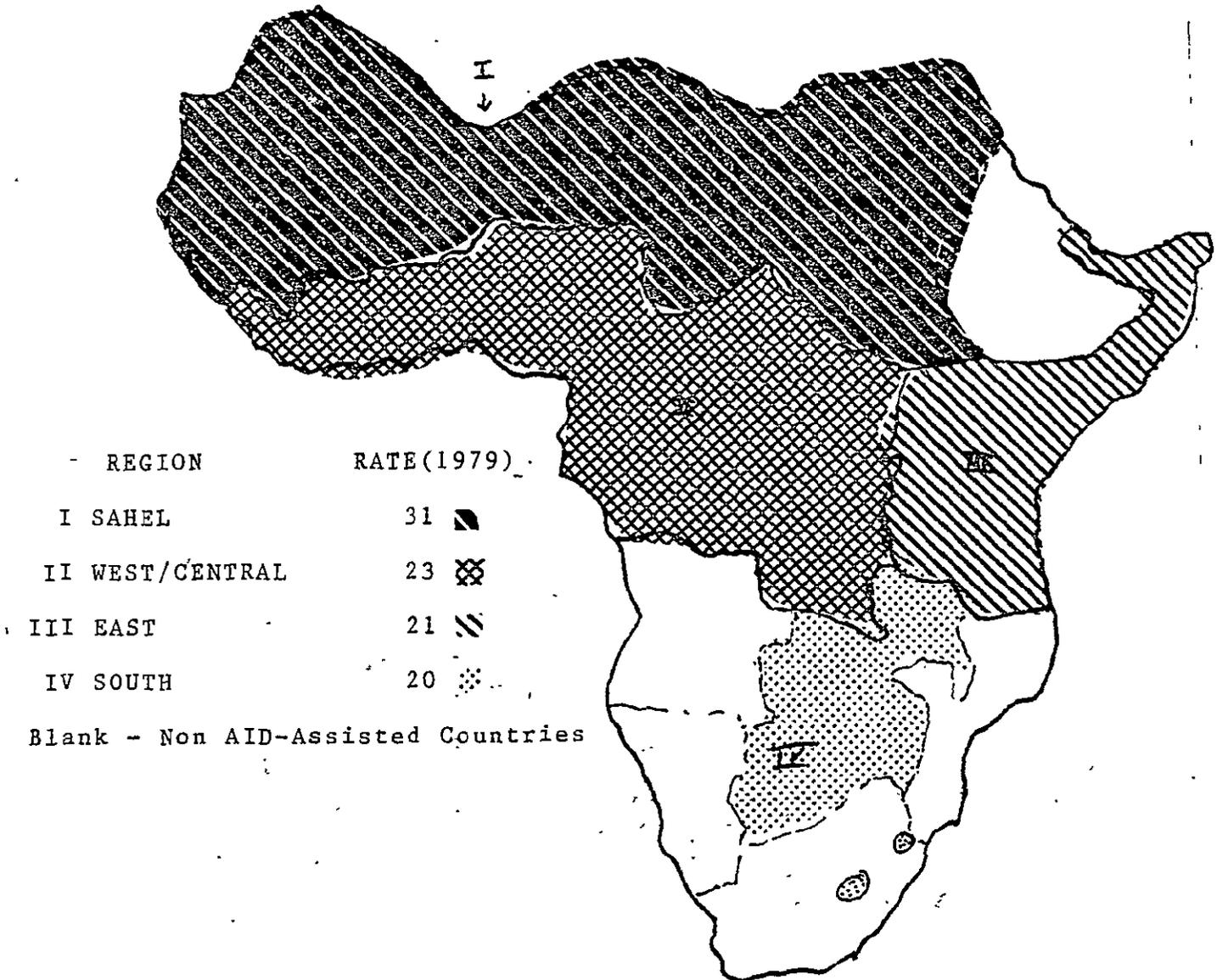
SUB-SAHARAN AFRICA, 1976-1979



Sources: See Table 1.

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FIGURE 2  
 CHILD MORTALITY RATES BY  
 SUB-SAHARAN AFRICAN REGIONS

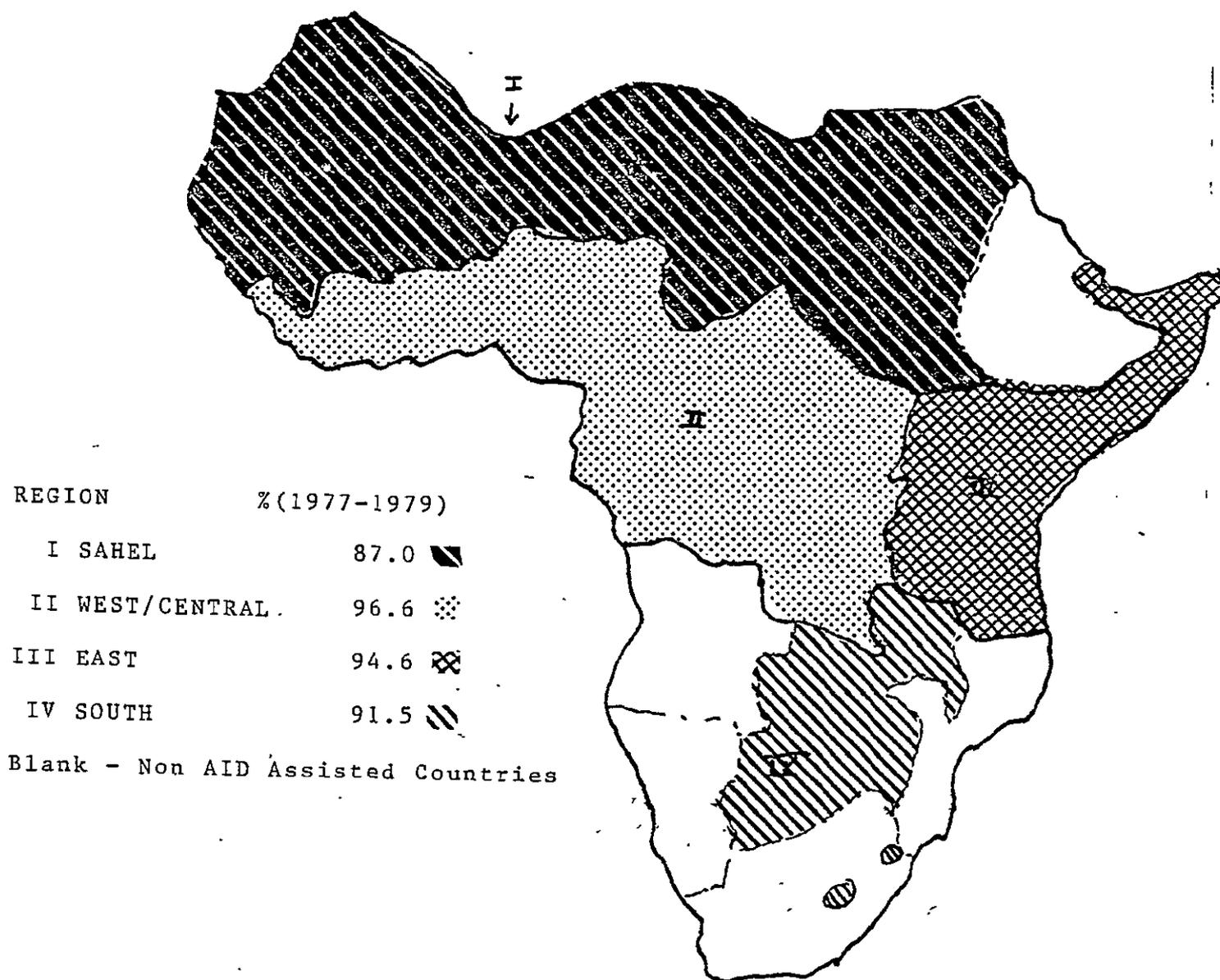


Source: USAID/ST/DIU. Indicators of Nutrition, 1982.

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FIGURE 3

PERCENT OF DAILY PER CAPITA CALORIE REQUIREMENTS  
SUB-SAHARAN AFRICAN REGIONS



Source: USAID/ST/DIU. Indicators of Nutrition, 1982.



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