CHAPTER 1

The State of World Hunger

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This is the fifth in a series of annual reports on hunger from the Alan Shawn Feinstein World Hunger Program at Brown University (Kates *et. al*., 1988; Kates *et al*., 1989; Chen, 1990; Millman, 1991). Three distinct but related concepts have been used to estimate the numbers of people affected by hunger and to analyze the global food situation: food shortage, food poverty, and food deprivation. They focus on different aspects of the phenomenon of hunger and different levels of aggregation involved in its study. The main body of this report will present various indicators that supply information about these concepts.

Food shortage occurs when total food supplies within a designated area — the world as a whole or continents, countries, or regions within countries — are insufficient to meet the needs of the population living within that area. *Food poverty* refers to the situation in which households cannot obtain enough food to meet the needs of all their members. *Food deprivation* refers to inadequate individual consumption of food or of specific nutrients, the form of malnutrition known as undernutrition.

The relationships between these three concepts are complex. On the one hand, the "higher" levels automatically imply the "lower" ones. If there is food shortage in a region, some households are bound to be food-poor for there is simply not enough food available to feed everyone; as a consequence, at least one member of each food-poor household will be food deprived. On the other hand, the "lower" levels can exist even in the absence of the "higher" ones. Food poverty can and does exist within households in regions where there is no aggregate food shortage, while individual food deprivation can occur in households that are not food-poor. The key factor in these cases is distribution.

FOOD SHORTAGE

Global Food Supply

Global food supply data allow us to answer the question: is there enough food in the world to provide all human beings with an adequate diet? The 1992 data (the latest year for which these data are available) say "yes." If we compute the global food supply in terms of calories and divide that number by the world's population (and assuming average per capita caloric requirement of 2350 kcal/day), there is currently enough food for 6.3 billion people — 15% more than the actual population. This continues the long standing trend: since the mid-1970s there has been more than enough food in the world to feed all its inhabitants.

But the adequacy of the global food supply depends not only on amount, but also on quality — on how one defines "adequate diet." Table 1 shows three types of diet representing different levels of nutritional adequacy and variety. The basic diet is almost purely vegetarian. It is assumed that few of the world's available cereals, roots and pulses, fruits and vegetables, are fed to animals.

Table 1.1. Numbers of People Supported by 1992 Global Food Supply with Different Diets

Population potentially supported by 1992 food supply with a	
basic diet	6.3 billion (115% of world population)
improved diet	4.2 billion (77% of world population)
full-but-healthy diet	3.2 billion (59% of world population)

Source: FAO, 1993.

Instead, they directly serve human consumption. The above computation is based on this diet.

The second diet is "improved" vegetarianism, supplemented by small amounts of animal-derived foods: 15% of the calories come from animal products. This diet is comparable to what many South Americans and Asians eat today. Finally, a "full-but-healthy" diet would incorporate richer and more varied foods (vegetables, fruits, oils), along with 25% of calories from animal sources. If we re-compute global food supply data in the light of these two diets, we find that in 1992, 4.2 billion and 3.2 billion people respectively could be fed with available food supplies — significantly less than the actual world population of 5.47 billion.

Another indicator used to assess global adequacy of food supplies is whether in a single year there are adequate carryover food stocks in the world for the following year, should it prove to be calamitous. The only data available are for cereals, and they show that from 1991 onward cereal carryover stocks have stabilized at 19-20% of world cereal consumption (Table 2). This is "slightly above the 17-18% which the FAO secretariat considers the minimum necessary to safeguard world food security." (*Food Outlook*, June 1993: 17)

Table 1.2. Cereal Carryover Stocks, million tons

	1990/91	1991/92	1992/93 (estimate)
All cereals	345	326	349
of which Developed countries	192	170	195
Developing countries	153	156	154
Stocks as % of World Cereal Consumption	20	19	19

Source: *Food Outlook*, June 1993: 2; FAO, 1992c: 34.

Thus, the global food supply data indicate there is no global food shortage. The world produces enough food for all its peoples, and contains enough cereal reserves to protect them against calamities. To be sure, the margins are slim: world food production is only sufficient to cover diets that are close to vegetarian,

and world cereal carryover stocks are close to the lower limit that is considered safe. But hunger in the world cannot be explained by an overall food shortage.

Food Self-Sufficiency

Global food supply data reveal only a very small part of reality. First, we need to disaggregate the numbers by looking at individual countries and their food self-sufficiency data, typically used to assess their capacity to feed their population. The left column of Table 3 presents the most recent ratios of food-staples self-sufficiency for all Third World countries. These ratios were

Table 1.3. Number of Countries in which Food Staples Self-Sufficiency Ratios

	were below 100% in 1986-88	increased from 1965 to 1988	remained stable from 1965 to 1988	declined from 1965 to 1988
sub-Saharan Africa	41	4	10	30
Near East & North Africa	12	1	0	14
Asia	19	9	6	8
Latin America	27	5	5	22
Total	99	19	21	74

Source: IFAD, 1992: 458.

calculated as the ratio of domestic production to domestic absorption (consumption), the latter being the sum of production and net imports. As can be seen, in 1986-88, 99 countries in the world had self-sufficiency ratios below 100%. The right side of the table shows long-term trends. Food self-sufficiency increased or remained stable for 40 countries and decreased in 74 others, covering most of Africa, the Middle East and Latin America. These data convey a very negative, if not alarming, impression.

However, to fully understand the significance of these data, we should look at them in more detail. The first column signifies that, in 1986-88, 99 countries imported more food than they exported; possibly, but not certainly, they used these imports to feed their hungry. The second, third and fourth columns indicate that the world's countries are becoming increasingly (inter)dependent on food imports — and on exports to pay for them. Appearances notwithstanding, negative (*i.e.* below 100%) or deteriorating food self-sufficiency rates do not mean that the incidence of hunger in these countries increased concomitantly, or even that their potential to feed themselves is exhausted. Several reasons account for this.

First of all, some of the countries in which food self-sufficiency decreased were far above 100% self-sufficiency to start with, and are still above it (*e.g.* the figures for Argentina decreased from 216 to 187). Furthermore, it can be to a country's advantage to import food and to export other products on which it can earn a good return. This is basic economic wisdom, known as the law of comparative advantage. The best examples are the Asian Newly Industrialized Countries (NICs), which account for most of the Third World's increase in food

imports during the last decades, yet these are countries in which hunger has been as good as eradicated. The Near East and North Africa region is another example, where notwithstanding the region's very negative food self-sufficiency record, the proportion of hungry people went from 23% to 5% (see Table 9) — one of the best trends in the world.

It is clear that the utility of national food self-sufficiency as an indicator of the extent of world hunger or of the extent or location of hunger in particular regions is limited. All it really tells us is that world food interdependence has increased. It does not mean that the 99 countries that imported food could not feed their populations with domestic production, if they so wished (*i.e.*, if the necessary resources were allocated to food, instead of other possible uses). Nor does it mean that they should strive to do this.

Indeed, if all countries had a 100% or more self-sufficiency rate, there would be no more international food trade. This would likely mean hardship and possibly starvation not only in many Third World countries but also (and even more so) for most of Europe, Japan and the Asian NICs — countries where the incidence of hunger is extremely low, because of industrialization accompanied by food imports. A low food self-sufficiency ratio is not an indicator of hunger within countries, nor is a high food self-sufficiency ratio a guarantee of the absence of hunger[i].

Like all trends, the increased food interdependence documented in Table 3 carries with it its own rewards and risks. The rewards were discussed above. The risks are real, too. First, countries that increasingly rely on food trade to feed their populations become vulnerable to factors beyond their control. These include not only international food availability and prices, but also changes in world prices for the products they export. After all, to import food, they must earn enough hard currency to pay for it[ii]. The smaller and poorer the country, the more pronounced will be its vulnerability to such fluctuations, and the less it will be capable of influencing them. Ultimately, the vagaries of the international market replace the vagaries of the weather.

Second, for the many farmers and agricultural laborers among the poor and the hungry, food production constitutes a crucial entitlement, both as a source of nutrients and a source of income. To the extent that declining food self-sufficiency ratios reflect declining entitlements to these people (and other sources of entitlement are not created for them), declining ratios can coincide with increasing hunger. Additional data are required to determine whether or not this is the case.

Dietary Energy Supplies

There is one more reason why food self-sufficiency data are of very limited use in any discussion of hunger: they measure only food production and imports, neglecting all other uses of food. Part of the food produced or imported in any country is not directly consumed, but rather stored, lost to pests and other predators, used as seeds for the next harvest, transformed into animal feed, or used in the industry. Dietary energy supplies (DES) per capita is a set of data that includes all these elements. DES figures add to those on domestic food production the food imports and variations in food stocks of countries; they subtract their exports, losses during storage and distribution, and the use of food as animal feed or seeds for the next season. They then convert these data into calories, and divide them by population. The result, then, is an indicator of the

Table 1.4. Per Capita Dietary Energy Supply by Region, 1990

sub-Saharan Africa	2099	North America	3600
Near East & North Africa	3094	Europe	3450
South Asia	2245	Oceania	3330
South East Asia	2446	Former USSR	3380
China	2657		
Central America	2822		
South America	2625		

Source: ACC/SCN, 1993: 119; FAO, 1992b: 21.

real average food availability for the (hypothetical "average") inhabitants of a region or country, expressed in calories.

In Table 4 and Figure 1, we reproduce the trend in DES per capita from 1970 to 1990. As can be seen, DES remains very low in sub-Saharan Africa and South Asia (below basic average requirements as used in Table 1). It is higher in the rest of Asia and in Latin America. DES is highest in all the developed countries, followed closely by the Near East and North Africa. The difference between the per capita availability of calories in sub-Saharan Africa and the United States and Canada is enormous: 1,500 calories per person per day.

As can be seen, average availability of food per capita has increased on all continents over the last 20 years, with the exception of sub-Saharan Africa and South America during the last decade. This increase has been very large for China (31%) and North Africa and the Middle East (28%).

DES data have two important limitations for the study of hunger in the world. One is that regional averages can, and do, hide important national (and sub-national[iii]) differences. Table 5 presents some subnational data on the former

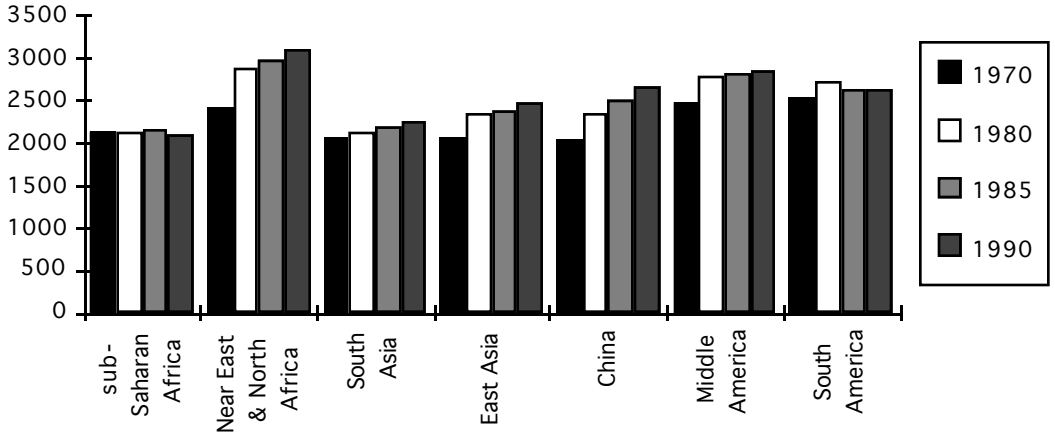

Figure 1.1. Evolution of Per Capita DES by Region, 1970-1990.
Source: ACC/SCN, 1993: 119.

USSR for the year 1990. There is a 40% difference between the republic with the highest and the lowest DES per capita; the lowest Republic, Georgia, is below the level of South America — and this for a region that was part of a superpower. Note that, as the USSR has since fallen apart, these data are no longer subnational, but national.

The second limitation of DES per capita figures is that, in order to supply real information about hunger, the indicator should include some comparison with dietary requirements. The calories needed in cold Georgia are not the same as in warm Brazil, to mention but one factor that influences dietary requirements. A 1974 committee convened by the FAO, the World Health Organization (WHO) and the United Nations University has standardized average caloric requirements at similar activity levels for all countries in the world. Table 6 compares DES data with these FAO/WHO/UNU requirements, showing the number of countries in which food availability (including imports, exports and changes in stocks, and excluding post-harvest losses, animal feed, seeds and food for industrial use) is not sufficient to guarantee the necessary minimum caloric intake for every citizen.

Table 1.5. Estimated per caput DES in the former USSR

State	1990 DES per capita	State	1990 DES per capita
Moldova	3485	Turkmenistan	2757
Ukraine	3363	Kyrgyzstan	2710
Belarus	3212	Azerbaijan	2704
Russia	3153	Uzbekistan	2635
Kazakhstan	3025	Tajikistan	2546
Armenia	2778	Georgia	2494

Source: FAO, 1992b: 112.

In the most recent period for which data are available, using the two-year period 1988-1990 to flatten out fluctuations, there were 48 Third World countries, with a total population of 802 million, in which the dietary energy supply was lower than that needed to adequately feed the populations. This does not mean that all persons within those countries suffer from undernutrition; even in calorie-deficit countries, some eat enough (even too much), and in calorie-surplus countries some go hungry. But it does mean that these countries cannot feed their entire populations with the food reported to be available within their borders.

Of these 44 countries, excluding the four islands, 11 had DES above requirement in 1981, meaning that their food availability turned from surplus to shortage. These 11 countries totaled 196.3 million inhabitants (115.8 million for Pakistan alone). This was counterbalanced, during the same period, by 11 other countries which moved out of food shortage, *i.e.*, their DES as a percentage of requirement moved above 100%. The total population of these countries was 1.01 billion (146.8 million without India)[iv].

Famine

The last indicator of food shortage focuses on the most visible and well-known hunger situation, that of famine. This is the harshest but least strident indicator. On the one hand, it represents the ultimate suffering and deprivation, often leading to starvation and death; on the other hand, the populations affected and the amounts of food needed to prevent famine are the smallest of the three indicators. Famines can be nature-induced or man-made. Drought and other natural catastrophes such as floods and earthquakes constitute nature-induced causes of famine. The latter essentially refers to wars and civil conflicts, and to the use of food as a weapon. Usually but not always, entitlements are destroyed through food shortage: harvests are not collected, crops not planted, livestock is killed, seeds are eaten.

The World Hunger Program has developed a variety of indicators to monitor the incidence of famines and food emergencies. The most long standing is the FAMINDEX, an overview of the number of "famines" and "food shortages" reported in the *New York Times* in a given year (Kates *et al.*, 1988: 34). To this have been added two other indicators: the number of emergency operations undertaken by the World Food Programme (WFP) (excluding protracted refugee and displaced persons projects) and the number of countries mentioned in FAO's *Food Outlook* as suffering from food shortages or famines. Table 7 presents these

Table 1.6. Countries with DES below requirement, 1988-90

	Number of countries	Population, millions
sub-Saharan Africa	32	459.1
Near East & North Africa	1	12.5
Asia	4	262.4
Latin America	7	67.2
North America, Australia, Western and Eastern Europe and the Community of Independent States (former USSR)	0	0.0
small islands	4	1.1
Total	48	802.3

Source: UNDP, 1993: table 13. For OECD countries, Eastern Europe and the CIS, see UNICEF, 1992a: table 2. Population data are the most recent ones: mid-1991. See World Bank, 1993: table 1. For a slightly different, and older, presentation of the same data, see IFAD, 1992: 32.

indicators for 1990, 1991 and 1992.

On all three indicators, the number of countries affected by food shortages and/or famine increased in 1992. The FAMINDEX yields the lowest figures. In 1991, 254 million people (or 5% of the world's population) lived in countries affected by famine or food shortage. In 1992, these figures decreased to 157 million and 3% respectively. This decrease is largely due to the fact that the 1991 figures are artificially inflated by the inclusion of Russia's 149 million inhabitants. It is very doubtful that there was anything approaching a real famine in Russia at the time; press sensationalism rather than factual accuracy accounts for its inclusion. Without Russia, the figures for 1991 become 105 million and 2% respectively, like the preceding year, and 1992 constitutes an increase compared to 1991.

The FAO data confirm this tendency: 1992 saw a significant increase in famines or sudden food shortages. Note that these figures do not mean that all people in these countries suffered from famine, but only that they lived in countries affected by famine. The number of people actually starving was certainly much lower, but reliable data on the actual extent of shortage leading to starvation do not exist.

Table 1.7. Indicators of Famine and Food Shortage

	FAMINDEX			WFP emergency operations	FAO famine and food shortages
	number of countries	number of people, million	percentage of world population	number of countries	number of countries
1990	5	104	2	32	
1991	5	254	5	44	11
1992	12	157	3	55	15

Source: WFP, 1993: 112, *New York Times* index, and *Food Outlook*, all monthly issues 1991-2.

The WFP figures are the highest because they refer not only to famines, but to all types of emergencies, from the very large to the localized. Table 8

Table 1.8. WFP Commitments for Emergency Operations by Region and Type, 1992

	sudden natural disasters	man-made disasters	drought/ crop failures	Total
sub-Saharan Africa	0	21	13	34
Near East & North Africa	0	5	0	5
Asia	4	7	0	11
Latin America	2	1	1	4
East Europe	0	1	0	1
Total	6	35	14	55

documents the nature and geographical distribution of the world's emergencies in 1992 (WFP, 1993: 112). That year, the category of "drought and crop failures" is almost entirely made up of a severe drought that hit South and East Africa, seriously affecting 23 million people (Reutlinger, 1993: 7). "Sudden natural disasters" refer to earthquakes and floods which tend to hit Asia disproportionately.

"Man-made disasters" refer to war or civil unrest. They constitute 63% of all emergencies, more than half in sub-Saharan Africa. Figure 2 charts their long-term trend, as seen through the number of WFP emergency operations approved for that purpose in a given year. The numbers rose from the end of the 1970s to the second half of the 1980s, then fell abruptly from 1988 to 1990 (WFP, 1987: 67). At the beginning of the 1990s, with the Cold War over and superpower competition

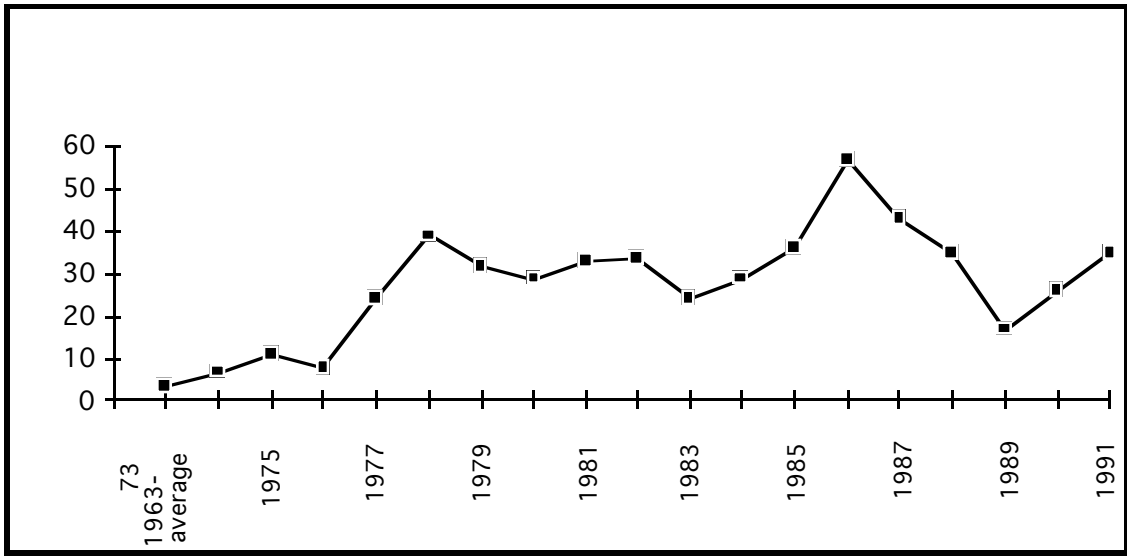

Figure 1.2. WFP Emergency Operations Approved for Man-Made Disasters, 1
Source: WFP, 1987: 67; WFP, 1993: 112

at a low, the total eradication of man-made (if not all) famine seemed possible, even imminent. Yet, from 1991 onwards, the resurgence of brutal ethnic conflicts throughout the world, and especially in Africa, has reversed the trend.

Refugees

An important category of food-short people, which partly overlaps with the preceding category of famines, is that of refugees. Refugees are defined as people who have been driven across international borders as a result of war or civil strife. Their possessions (assets) and sources of income disappear, often overnight. As a result, their entitlement set collapses, in the worst cases below starvation level. The latest data by the United Nations High Commissioner for Refugees (UNHCR), the U.N. organization primarily responsible for assisting and repatriating refugees, indicate that at the end of 1992, 19.7 million persons were refugees, an increase by almost 1 million and 3 millions compared to 1990 and 1991. In 10 countries, refugees constitute more than 5% of the total population; all of these are poor countries. (U.S. Committee for Refugees, 1993: 53) In addition, approximately 24 million people forced out of their homes and regions remain within the borders of their own countries (UNHCR, 1993). According to international law and practice, these are not properly speaking refugees, but "displaced persons." These data, then, confirm that the spread of ethnic conflict since the end of the Cold War is pushing increasing numbers of people into extreme food insecurity.

For the first time in fifteen years, this sad evolution touches Europe. In 1992, the WFP began emergency operations in Eastern Europe; the previous one on that continent was in 1979, in South Europe (WFP, 1987: 67). According to the UNHCR, Europe now has 3.6 million refugees, largely as a result of fighting in the Balkans. The future is bleak. According to a recent U.S. State Department report, the lives of 4.2 million people in the former Yugoslavia are "at risk" this winter because of fighting, disease, malnutrition and lack of shelter (*New York Times*, Nov. 11, 1993: A9).

FOOD POVERTY

Food poverty is the inability of households to obtain sufficient food to meet the nutritional needs of their members due to inadequate income, poor access to productive resources, inability to benefit from private or public food transfers, or lack of other entitlements to food. As is generally accepted since Amartya Sen's (1981, 1987) work on entitlements, extensive food poverty may persist in countries and regions with more than enough food to meet the nutritional requirements of all their people (*i.e.*, without food shortage). Distributional entitlement failures as the source of hunger are most serious in Latin America and the Near East and North Africa, where, despite high average DES per capita, millions of people (58 and 12 million respectively in 1990 — see Table 9) have inadequate access to food.

In this section, we will present estimates of numbers of people living in households that cannot afford to provide their members the dietary energy (calories) they require. Throughout the 1970s and the 1980s, there were two main sources of estimates of the worldwide incidence of food poverty: the Food and Agriculture Organization (FAO) and the World Bank. Both of these organizations used slightly different methodologies, which they readjusted regularly. As a result, their data were not comparable, either historically or

Table 1.9. The Proportion and Number of Chronically Underfed

PROPORTION in percentages	sub-Saharan Africa	Near East & North Africa	Middle America	South America	South Asia	East Asia	China	All
1970	35	23	24	17	34	35	46	36
1975	37	17	20	15	34	32	40	33
1980	36	10	15	12	30	22	22	26
1990	37	5	14	13	24	17	16	20
ABSOLUTE NUMBERS in millions								
1970	94	32	21	32	255	101	406	942
1975	112	26	21	32	289	101	395	976
1980	128	15	18	29	285	78	290	846
1990	175	12	20	38	277	74	189	786

Source: ACC/SCN, 1992: 105.

geographically. Both organizations use basically the same process. They start by calculating a country's food supply by totalling all food produced and imported in a country (cereals, roots and tubers, oils and fats, vegetables, fruits,...), minus carryover stocks, loss, seeds and exports. They then convert these totals into grain equivalents, add the distribution of food among households, and compare these results with the energy needs of the population. What differs is the cut-off point or threshold of undernutrition and the method of computing the distribution of food within countries.

For the World Bank, the threshold level was set at 90% of the caloric

Table 1.10. The Number of Malnourished: Different Estimates, Millions

source	FAO 5th survey	FAO Toward 2000	World Bank 1986	ACC/SCN 1987	FAO 1992	FAO 1992
reference period	1979-81	1983-84	1980	79-81	1979-81	1988-90
method of calculation	1.4 BMR	1.4 BMR	90% of FAO/WHO/UNU	1.2 BMR	1.54 BMR	1.54 BMR
Sub-Saharan Africa	99	142	150	80	128	175
Asia (without China)	313	291	510	197	363	351
Latin America	56	55	50	30	47	58
Near East & North Africa	25	24	20	10	15	12
Total	493	512	730	317	553	596
corrected to include China		685	1045	465	843	785

Source: Columns one to four, see Uvin, 1994: chapter 3. For columns five and six, see FAO/WHO, 1992a: 6 and FAO, 1992a: 10. Some of the information in the row "method of calculation" comes from Chen & Pitt, 1991: 4 -20. "BMR" is basic metabolic rate.

requirements established in 1971 by the FAO/WHO/UNU committee of experts mentioned above (see page 6). This caloric cut-off point supposedly allows for people to perform adequate work. The FAO used 1.4 times the Basic Metabolic Rate (BMR — the caloric expenditure of an immobile body in a warm environment) as its cut-off point, a lower measure that allows only for the maintenance of bodily functions and minimal activity for adults. For children, a much higher caloric cut-off point was and still is employed, allowing for desired full growth and based on the needs of American children.

As can be seen in Table 10, the World Bank a computed a significantly higher number of food-poor people than the FAO. Note that both organizations also defined second, lower cut-off points — 80% of nutritional requirements and 1.2 BMR respectively — that yielded more similar results, but these points are generally considered too low for adequate physiologic function.

The Latest Update: New Methods, New Results

In 1992, in preparation for the International Conference on Nutrition, the FAO produced revised esitmates for the number of food-poor households in the world. Currently, these new data and the methodology used to compute them are accepted and reproduced by all international organizations (including the World Bank: Serageldin, 1993: 2). The new data include three methodological innovations. First is the inclusion, for the first time, of five communist Asian countries: China, Mongolia, Cambodia, Vietnam and North Korea. The inclusion of China alone, given its population size, has an important impact on the new global hunger numbers. Second is that the estimates of the distribution of income and subsequent variations of access to food within countries have been revised, based on the analysis and adjustment of hundreds of national household surveys. In most surveys, the reference period for data collection at the household level is between one week and one month. For the new FAO computation, however, the reference period is one year, thus excluding short-term, random, and seasonal variations. This has resulted in a significant downward change in the average coefficient of variation of access to food within countries, from 0.37 to 0.20. Third is that the cut-off point for undernutrition has been increased to 1.54 BMR, corresponding to the protein-energy consumption that allows for light activity but excludes productive manual labor (ACC/SCN, 1993: 112)[v]. For children, however, the "ideal body weight" cut-off point is still employed[vi]. As a result, the new data represent "the number of people who on average during the course of a year did not consume enough food to maintain body weight and support light activity" (FAO, 1992a: 8).

The resulting estimates of the number of malnourished persons worldwide differ very little from previous FAO data. Yet, much larger differences appear in historical *trends*. Using the new methodology, the FAO has re-computed the number of food-poor people for the period 1970-1990. In the re-computed data series, reflecting the increased cut-off point, estimates of past hunger are significantly higher than past FAO estimates. Consequently, as the FAO states it, "the present assessment shows a faster pace of decline in the proportion of the population undernourished than would have been the case if the approaches had remained unchanged (FAO, 1992a: 15)." As a matter of fact, until these data were published, it was commonly assumed that the proportion of hungry people in the world had declined slowly but consistently over the last decades, but that, as a result of population growth, the absolute number of the food poor had continued to

grow. According to the new data, the absolute number of the food poor in the world has begun declining since 1975, from 976 to 786 million persons in 1990. The picture that emerges, then, is more positive than generally assumed: the incidence of hunger in the world has declined significantly, and fewer people are undernourished now than fifteen years ago, notwithstanding the addition of approximately 1.1 billion persons to the Third World's population.

However, this globally positive scenario masks very different regional realities. Indeed, the same data, disaggregated by geographical region, show that the 1980s have been a period of stagnation and even loss in sub-Saharan Africa and South America, both of which have seen the proportion , and the number, of food-poor households increase. Both of these regions have most strongly undergone structural adjustment policy reform, which, according to many, is linked with the growth of undernutrition. South America and to a lesser extent sub-Saharan Africa have populations and hunger numbers that are small compared to Asia: both India and China have more inhabitants than these two continents combined. Thus, on a global basis, the positive trend in Asia, and especially in China, more than compensates for the deterioration in Latin America and sub-Saharan Africa.

Food Poverty in the United States

In the United States, the Center on Hunger, Poverty and Nutrition Policy at Tufts University, directed by Larry Brown, estimates that 13% of all Americans, or 30 million people, (12 million children and 18 million adults) are food poor. These figures have come under heavy attack from American conservatives, who charge that they are based on shaky assumptions rather than on first-hand observations or interviews. The most commonly used method of estimating food poverty in the U.S. is through interviews, in which randomly selected Americans are asked whether they know someone who at some time in the past year did not have enough to eat. This methodology is even less rigourous than the one used for calculating Third World food poverty. Not only is it based on subjective impressions, but it is also biased towards overestimating the extent of food poverty by overplaying short-term, random occasions of low food consumption. Other sources and methods to estimate the number and the trend of the food-poor are also employed in the U.S.: number of requests for emergency food assistance at local municipalities, number and attendance of food centers, and numbers of meals served by these, participation in food-stamp programs, surveys done among those living below the poverty line, etc. All these provide important information about trends in food assistance, but are unreliable as far as absolute figures on food poverty go. Hunger and undernutrition certainly exist in the U.S., but currently available national data provide unreliable estimates of the situation.

The Poor and the Hungry

The term "food poverty" emphasizes that hunger is, more than anything else, a matter of poverty. It is an incapacity of households to obtain access to food, rather than a national scarcity of food. This was already evident from the fact that the world as a whole produces more than enough food to feed all of its inhabitants a basic diet, albeit not a full and healthy one. It is even more evident in the regional data. In certain regions there is more than enough food to give all the population a healthy diet, yet there are still millions of hungry persons: 12 millions in the Near East and North Africa and, especially, 38 millions (13% of

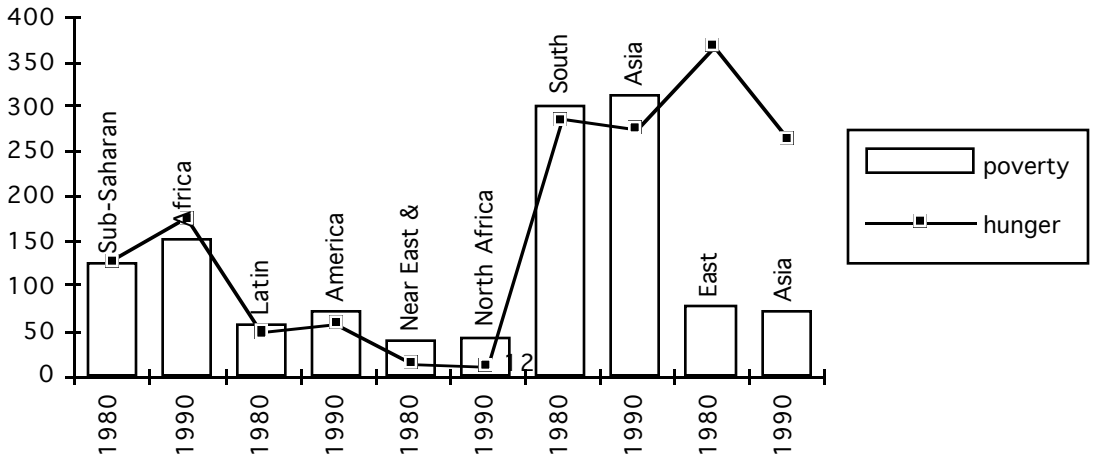

Figure 1.3: The Number of the Poor and the Hungry, 1980 and 1990, in millions. Source: Data on hunger from ACC/SCN, 1993: 105. Poverty data are 1985 and 1990; see Lipton & Maxwell, 1992: 4.

the population) in South America. The latter truly disturbing figure tells a lot about the income inequality in that part of the world.

Another way of looking at the link between hunger and poverty is to compare data on their incidence, as in Figure 3. For most continents, the link between poverty and hunger is almost perfect. With the surprising and inexplicable exception of East Asia, the number of poor people is almost identical to the number of hungry persons as calculated by the ACC/SCN[vii]. For all regions, with the exception of the Near East and North Africa, the trend in the incidence of hunger and poverty is identical, *i.e.*, similar increases in both hunger and poverty in sub-Saharan Africa and in Latin America, and similar declines in all of Asia. This lends credibility to those approaches that define (absolute) poverty in terms of access to food, a lack of it being both a major effect and cause of extreme poverty (Lipton, 1988).

National Food Poverty

We have looked at the food poverty of households, defined as their capacity to gain access to sufficient quantities of food. We can also speak about the food poverty of nations, defined as their capacity to grow and import sufficient food to feed their populations. This is what is usually called national "food security." A theme paper on this subject, prepared for the International Conference on Nutrition, suggests two indicators for national food security: quantities of available food versus food needs in a country, and a country's net food import needs versus its total import capacity (FAO/WHO, 1992b: 3). The former indicator has been presented in Table 4, which gives the number of countries with per capita dietary energy supplies below requirement. The latter indicator is presented in Table 11, which details various countries' capacity to finance their food imports (imports must be paid for in foreign currency, which is earned through exports).

Table 1.11. Food Imports as a Proportion of Total Exports, 1988-1990, in percent

sub-Saharan Africa		Latin America	
Cape Verde	524	Haiti	87
Gambia *	167	Nicaragua *	37
Lesotho	152	Dominican Republic *	27
Djibouti	139		
Mozambique	127	**Near East & North Africa**	
Guinea-Bissau *	105		
Somalia *	94	Egypt	116
Comoros	88	Yemen	96
Sierra Leone	63	Sudan *	37
Ethiopia *	56		
Burkina Faso *	35	**Asia**	
Togo	33		
Senegal	31	Samoa	102
Benin *	29	Bangladesh	54
Rwanda *	29	Cambodia	51
Mali *	28	Afghanistan *	47
Mauritania	26	Nepal	34
		Laos	33
		Sri Lanka *	26
		Maldives	25

Source: FAO, 1992b: 11. The countries with asterisks are those mentioned in the same document, page 12, as "highly dependent on agricultural exports."

The food imports of 31 countries are valued at more than 25% of their export earnings for 1988-1990. Even if the countries at war (Mozambique, Ethiopia, Nicaragua, Afghanistan, Sudan, which could manage with fewer imports if war did not destroy their production capacity) were removed from the list, the picture that emerges is still very bleak.

It is important to note, however, that food aid (valued at world market prices) is included in this table. Egypt, Bangladesh, Ethiopia and the Sudan are among the world's largest food aid recipients. If these countries had to import on a commercial basis all the food that flows into their country, it would cost them as much as indicated in Table 11. Their actual spending on food imports (as a proportion of exports), however, is much lower.

For these countries, the issue then is: how secure is their food aid? Such aid is increasingly governed by a set of developmental principles that favor allocation based on need, substitution for commercial imports, multi-year commitments, integration of food aid into development policies and programs, etc.

Many donors have laws requiring them to donate food mainly to the so-called Low-Income Food-Deficit Countries (LIFDCs)[viii]. To the extent that food aid constitutes a reliable, need-based, international transfer mechanisms, the food security situation of most countries in Table 11 is less bleak than would appear at first sight (Uvin, 1992).

One more observation must be made here. Some of the countries that are highly dependent on food imports are also highly dependent on agricultural exports. Indeed, the same FAO report (1992b) from which the data in Table 11 were taken contains, on the next page, a table on agricultural export dependency. In that table, we find 13 of the 31 same countries listed in Table 11: Benin, Burkina Faso, Ethiopia, Gambia, Guinea-Bissau, Mali, Rwanda and Somalia; Dominican Republic and Nicaragua; Afghanistan and Sri Lanka; and the Sudan. For ten of these, agricultural exports are significantly larger than their (potential) food imports. This raises questions about the efficiency and equity of economy-wide allocation of resources in these countries. Are they exporting agricultural commodities because they have a comparative advantage in doing so and in importing food with the proceeds? Or is theirs a situation of double dependency, a legacy from colonialism and misguided policies, a reflection of dualistic economies, in which a thriving but small export sector coexists with a large stagnating food crop sector? Sadly, for most of these countries, the latter explanation is the most likely.

FOOD DEPRIVATION

Food deprivation results from the inability of individuals to obtain sufficient food to meet their nutritional needs. This can be due either to overall food shortage, to household food poverty, or to the existence of a special need that is not satisfied. The latter is most often the case for pregnant and lactating women, sick persons, children, and the elderly.

A set of indicators that supply information about various aspects of food deprivation exists. This includes: women age 15 to 49 with weight below 45 kg and infants born underweight (both reflecting undernutrition in women of childbearing age); infants stunted and wasted and pre-school children underweight for age (measuring childhood undernutrition) and the existence of vitamin A, iron, and iodine deficiencies (measuring so-called “hidden hunger”). Here we will briefly present the most recent data on the above indicators with the exception of the micronutrient deficiencies, which we will discuss in the next section of this paper.

Women

The latest data reproduced in the Second Report on the World Nutrition Situation show that 400 million women of childbearing age — or approximately 45% of the total — have a weight below 45 kg (ACC/SCN, 1992: 2). This does not mean that all are malnourished (or that every woman weighing more than 45 kg is well nourished), but a weight this low is a readily available indicator that is more or less linked with undernutrition, and often indicates obstetric risk. This proportion varies from 62% in South Asia and 44% in South East Asia, to 21% for sub-Saharan Africa and 10% for South America (ACC/SCN, 1993: 116). Other similar indicators computed by ACC/SCN, such as the proportion of women whose height is below 145 cm., whose arm circumference is below 22.5 cm, or whose Body Mass Index (BMI) is below 18.5, basically present the same picture,

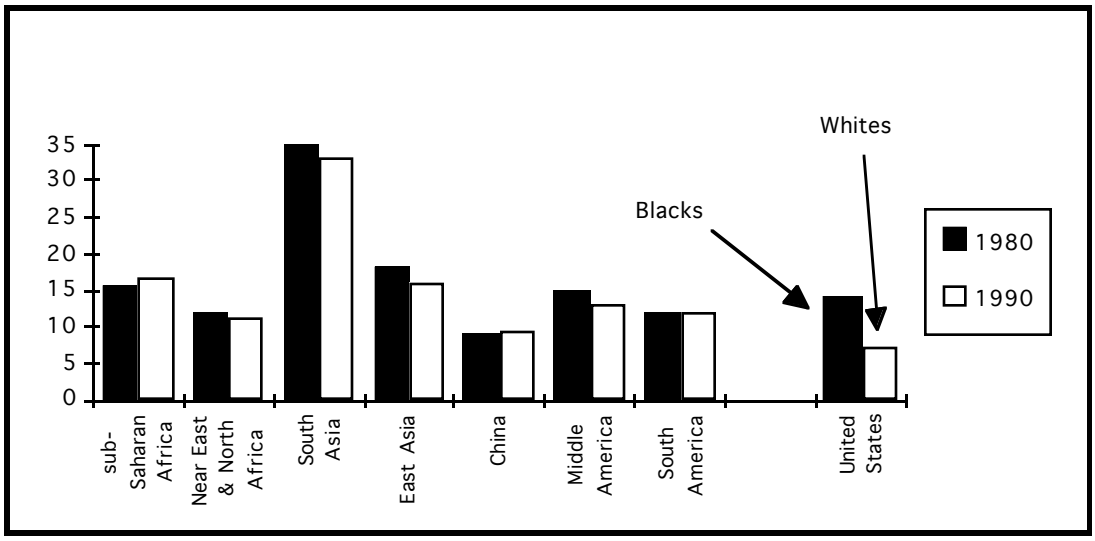

Figure 1.4. Proportion of Infants with Low Birthweights (below 2.5 kg). Source: ACC/SCN, 1992: 55; Children's Defense Fund, 1992: 2. U.S. data are for 1990.

including the same regional variations, with South Asia and South East Asia always having a far higher proportion than the other regions, Africa in the mid-range, and South America presenting the best picture (ACC/SCN, 1992: chapter 4).

Children

A variety of sources publish data on the percentage of children with low birthweight. The most recent data are from 1991, and come from the WHO. Table 14 reproduces the ACC/SCN table from its latest Report. Not surprisingly, the relative level and trend are the same as those for the incidence of hunger: decline in all of Asia (with the highest incidence in South Asia), stagnation in Latin America, and increase in sub-Saharan Africa.

In Figure 4, we added data on the percentage of infants born at low birth weight in the United States in 1990, average and for blacks only. At face value, these figures convey a dramatic message: the low birthweight rate for African-Americans places them in 77th position worldwide, after countries such as Ivory Coast, Guinea-Bissau, Mauritania, Iraq, Senegal, Lesotho. Even the *average* U.S. data place the country in 31st position, behind all other industrialized nations and quite a few Third World countries, including Costa Rica, Egypt, Iran and Hong Kong (Children's Defense Fund, 1992: 2). That this denotes a serious public health and social policy problem in the U.S. goes without saying.

As can be seen from Table 12, however, significant disagreement exists between sources as to the level and even the trend of this indicator: in the three examples below, UNICEF data increase while WHO figures decrease.

Table 1.13. Proportion of Children Wasted and Stunted, 1980-1990

	wasting (12-23 months)	stunting (24-59 months)
sub-Saharan Africa	10	39
Asia (without India and China)	11	53
India	27	65
China	8	41
Latin America	5	26
North Africa	2.5	25
All	13	46

Source: World Bank, 1993: Table A.6. Data are weighted averages. Data for the Near East are not available, hence weighted averages for North Africa are presented. See also UNDP, 1993: Table 11.

Tables 13 and 14 present data about child food deprivation. In Table 13, "wasting" is defined as low weight-for-height, and "stunting" as low height-for-age; the cut-off point for "low" is set at 2 standard deviations below the median for the reference population. Wasting measures acute or short-term malnutrition, while stunting indicates chronic malnutrition. Nutritionists agree that wasted children can catch up later, approximately regaining their normal weight, provided they receive sufficient food intake. This is not the case, however, for stunting, which is largely irrepairable, especially in combination with seasonal food shortage, micronutrient deficiency, poor sanitation and frequent illness. As a result, stunted children most likely never regain their full height or cognitive potential (Allen, 1993: 259, 265). This makes the overall figure on stunting extremely worrisome. It indicates that 46%, or almost half the world's children, are "too short" due to malnutrition (usually in combination with infection); they are likely to remain stunted (*i.e.* with low weight for age) throughout their adult lives.

Table 1.12. Infants with Low Birthweight, 1980-1990, Different Estimates, in percent

	BRAZIL			BOLIVIA			CHINA		
	1980	1985	1990	1980	1985	1990	1980	1985	1990
UNICEF	9		11	10		12	6		9
World Bank		8			15			6	
WHO		10	8		10	7.5		10	6

Source: UNICEF, 1992b; World Bank, 1993: Table 28; WHO database, 1992 (I thank ACC/SCN for sending me these data).

This figure is extremely high. It is significantly higher than any of the other data on undernutrition available to us, such as the proportion of chronically underfed people (adults and children) in the world (Table 9) or the proportion of underweight pre-school children (Table 14). To a certain extent, this can be explained by the fact that these other indicators really measure different things: the 20% of the world's population that is chronically undernourished as documented in Table 9 can coexist with the 46% of children (and, by extension, adults) that are stunted: all it means is that, as a result of acute undernutrition during their early growth period, half of the developing world's children (and adults) are too short for their age, but only 20% of them actually do not receive enough calories in any given year. But partly this discrepancy also puts into doubt the validity of the reference population. Being stunted (*i.e.* "too short") is defined by comparing peoples' height at a given age to the heights indicated in the reference tables.

It could be that these references are inappropriately high, thus overestimating the incidence of stunting in the world. This could be especially the case for India and the rest of Asia, where the data on stunting are extremely high. We will come back to this on the next page. But before we do so, we will present one more commonly used indicator on food deprivation: the proportion of underweight children, defined as below 2 standard deviations of reference.

Table 14 shows that, in 1990, 184 million children age 0 to 5 years were underweight; this included 34% of all the Third World's children. Table 14 presents the trend by region. Globally, while the proportion of underweight children has continuously, albeit unevenly, declined during recent decades, their absolute number has continued to increase, from 168 to 184 million children.

Note that these data hide important national and subnational differences: in Latin America, notwithstanding impressive improvements, child malnutrition

Table 1.14. Proportion of Underweight Pre-School Children (0-60 months), in percent

	1975	1985	1990	2000 low estimate	2000 high estimate
sub-Saharan Africa	31.4	29.9	29.9	27.0	32.0
Near East & North Africa	19.8	15.1	13.4	8.0	11.0
South Asia	67.7	61.1	58.5	49.0	54.0
East Asia	43.6	34.7	31.3	22.0	24.0
China	26.1	21.3	21.8	16.0	22.0
Middle America	19.3	15.2	15.4	10.0	16.0
South America	15.7	8.2	7.7	2.5	6.0
World	41.6	35.1	34.3	27.5	32.0
Absolute number of children	168	178	184	108	206

Source: ACC/SCN, 1992: 67.

is at least 40% higher in rural than in urban areas; sometimes the difference is as much as 100 or 200% (*e.g.* Paraguay and Peru). Often, this disproportionate burden falls on the indigenous populations (Psacharopoulos, 1993).

Table 14 also documents a stagnation in the proportion of underweight children during recent years in sub-Saharan Africa, Middle America and China. This observation is in parallel with all other trends presented in this report for the former two regions but not for China. Indeed, the documented increase in childhood malnutrition in China contrasts singularly with the extremely positive trends during the same years in DES per capita (see Figure 1), in overall malnutrition (see Table 9) and in childhood mortality (see Figure 5).

More generally, the proportion of preschool children malnourished (and of stunting) in South Asia, and to a lesser extent in South-East Asia, is striking. It is double the proportion for sub-Saharan Africa, although all other indicators of poverty, food availability per capita, under-5 mortality, etc., are much *worse* in sub-Saharan Africa than in those parts of Asia. Figure 5 presents a comparison between the proportion of undernourished preschoolers and the under-5 mortality rates for all regions. The link between these two indicators should be strong, since one of the main effects of undernutrition is increased morbidity and mortality. Yet, as one can see in figure 5, the cases of South Asia and to a lesser extent South East Asia and China in 1990, stand out as strong discrepancies.

It seems, then, that the data on childhood malnutrition are subject to much doubt and ambiguity. Trends in China and South America, as well as absolute figures for all of Asia display strong discrepancies with other available data. Two reasons could explain this. Either one of the two indicators is wrong, or external variables account for the discrepancies. As to the latter, regional differences in income distribution, epidemiology, sanitation, or the quantity and quality of health services could explain part of the puzzle. Data on the number of physicians or nurses per capita as well as the proportion of children immunized are indeed better in Asia than in sub-Saharan Africa (World Bank, 1993: A8), but it is unlikely that these differences alone account for the pronounced discrepancies observed above. Hence, the former point — that one of the indicators is plainly wrong or biased — merits being taken seriously.

The methodology for computing childhood malnutrition rates is different from that used in tabulating overall malnutrition. The latter method derives household food consumption from national food availability data (weighted by income distribution); the method used to compute childhood malnutrition utilizes 120 different national children's nutrition surveys. Statistical manipulations are applied to correct for a variety of errors and discrepancies; two multivariate regression models (one for sub-Saharan Africa and one for the rest of the world) are then used to derive estimates of country prevalences for the years 1970, 1975, 1980 and 1990. This method has the important advantage of starting from actual observed data obtained through the collation of all available national children's nutrition surveys (ACC/SCN, 1993: 91-110).

Its main weaknesses are the absence of reliable surveys and the disputed relevance of the reference standard. As to the former, for almost half of the developing countries there are either no children's surveys or no surveys from the last decade[ix]. The published data are estimates derived from assumptions made by experts about trends in food production, poverty, disease and the like. These assumptions depend on commonly accepted, preconceived ideas, which can be, but rarely are, criticized.

Take the case of sub-Saharan Africa. The available primary data for indicators such as infant mortality, food production, trade and consumption and most other hunger-related variables, are either totally unreliable or non-existent. As a result, experts have to use assumptions in order to produce the kind of data we find in World Bank, FAO, WHO and United Nations Development Program (UNDP) reports. Experts generally assume that the situation in sub-Saharan Africa has worsened significantly in all respects over the last decade; in the case of food, this is often based on recorded increases in food imports (Schatz, 1986). Not surprisingly, the statistical data, based largely on these assumptions, "prove" deteriorations as expected. Yet, authors who have studied the available

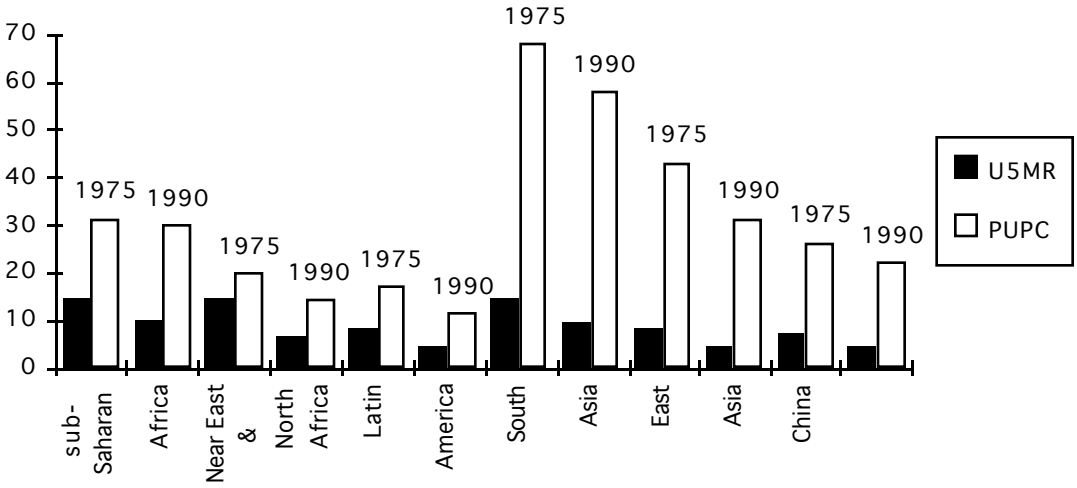

Figure 1.5. Proportion of Underweight Pre-School Children (PUPC, in %) and Under-5 Mortality Rate (U5MR, in %); Weighted Averages by Continent, 1970-5 and 1990-1.
Source: Under-5 mortality for 1970 and 1991:World Bank, 1992: Table 28. Proportion of undernourished preschool children: ACC/SCN, 1993: 105.

food data, mainly from FAO, conclude that there is every reason to assume significant and increasing underestimation of domestic food production and consumption, and, as a consequence, overestimation of hunger[x]. The opposite might hold for certain Asian countries, such as China, for example, in which figures are set politically to "prove" a positive trend — and reproduced by international organizations.

The other issue concerns the cut-off point for childhood malnutrition in the world, which is set at the level of full and healthy growth of U.S. children. This is significantly higher than the cut-off point used for adults — light work — thus relatively overestimating the presence of malnutrition in children (or underestimating it in adults). A more important problem with this cut-off point for children is that it might be too high. Small size may be a form of adaptation to lowered dietary intake without adverse effect on health or development. Or it may be that the physical build of Asian (or Andean, for that matter) children is genetically smaller and these children thus need fewer calories than their U.S. counterparts. Both these assertions are the subject of long-standing controversies among nutritionists, statisticians and anthropologists (Kates *et al*., 1988: 36). Those in favor of the existing reference values, based on the requirements of U.S. children, argue that studies have shown that whenever Asians are fed better, their growth resembles the reference children's growth — hence, their small size is not something genetic or adaptively neutral, but the result of structural malnutrition with possible important functional impairments[xi]. Others argue that small size (and thus lower caloric needs) is beneficial and adaptive in Asia, and that, if smallness reflects anything at all, it usually "is a record of past episodes of illness or deprivation and not necessarily of current conditions (Payne, 1990: 23, 29)." This discussion is important because, given the enormous size of the Asian continent, their data on childhood (and, for that matter, adult) undernutrition, and of stunting, weigh heavily in the world estimates on the numbers of hungry people and the trends of hunger in the world[xii].

MICRONUTRIENTS

Less visible than protein-energy undernutrition are deficiencies in the micronutrients, *e.g*. iron, iodine, vitamin A, and the other vitamins, major minerals and trace elements. These manifestations of "hidden hunger" are extremely important both because of the number of people who suffer from them, and because of their health consequences.

Until recently, micronutrients were low on the development/hunger agendas. As a result, few programs specifically designed at remedying these forms of undernutrition were implemented, and few efforts were made at gathering reliable and comparative data. However, in the second half of the 1980s, and especially since the beginning of the 1990s, considerable efforts have been undertaken to remedy this situation. International organizations of specialists have been created, and databases, among others for iodine, have been started. The major donors (World Bank, UNICEF, United States Agency for International Development) have strongly increased their budgets for programs in these fields. The reasons for this increased interest in micronutrients include the recent understanding that micronutrient deficiencies touch more people and have more serious consequences than previously thought and that prevention or treatment of such deficiencies can be achieved at low cost (Maxwell & Frankenberger, 1992: 26; UNICEF, 1992c: 9). According to Reutlinger (1993: 9), a third reason is that

measures to deal with these kinds of malnutrition have the capacity to "reduce human suffering yet do not threaten the existing economic and political structures."

Vitamin A deficiency can lead to various forms of damage to the eye, ranging from night blindness to full blindness, and to increased morbidity and mortality in young children between 6 months and 6 years old. It also increases the severity of measles and other infectious diseases, dramatically increasing their morbidity and mortality. According to a group of experts, "these increases occur at levels of vitamin A deficiency less severe and chronic than required for night blindness and other manifestations of xerophthalmia [...] — *i.e.*, [with] populations which are only mildly or marginally deficient." Vitamin A supplementation is therefore recognized as an important, effective and potentially efficient intervention tool, capable of "reducing childhood mortality by as much as 34% (Helen Keller International, 1992; ACC/SCN, 1992: 39)."

Iron deficiency leads to iron anemia, impaired work performance, damaged learning ability and dysphagia. It is increasingly recognized that these impacts occur even in the absence of clinical iron-deficiency anemia, *i.e.*, with small deficiencies. Iron deficiency anemia is particularly widespread in premenopausal women. It increases their susceptibility to illness, pregnancy complications, and maternal death (U.N., 1991: 58), in addition to decreasing their productivity.

Among the effects of iodine deficiency are goiter, cretinism, deaf-mutism, impaired fetal growth and brain development. According to the experts, iodine deficiency is probably the leading cause of preventable mental retardation in the world today, and may have important effects on socioeconomic development (WHO, 1991: 5). Concomitantly, "when iodine is restored to an iodine deficient community, cretins no longer are born, and improvement occurs in the indicators of thyroid function which probably signals an improvement in human performance." Both cretinism and goiter disappear, and with them their burden on the health system and the community (Stanbury, 1992).

Hence, micronutrient deficiencies put a significant burden on children and can have lasting effects, decreasing both their immediate chances of survival in case of sickness and their long-term learning and work capacities.[xiii] As the WHO states:

> *"Thus in fact all three forms of micronutrient malnutrition [vitamin A, iron and iodine — PU] have quadruple effects, through impairment of growth and development (physical and mental) and survival of infants and young children; physical and intellectual development of school-age children; work performance and productivity of adults; and reproductive performance of women. Thus the micronutrient deficiencies each singly constitute a brake on socioeconomic development and mostly are combined in synergistic action to the detriment of the world's already underprivileged groups." (*WHO, 1991: 5*)*

We can present the global micronutrient situation using the terms of micronutrient shortage and deficiency. Shortage, computed from FAO food supply data, draws attention to the physical availability of micronutrients in given geographic regions; deficiency provides information on actual malnutrition on the individual level. For both indicators there are often no data at all; where they exist they are often not reliable. As a result, global statistics are often based on generalizations of the few available data. Consider how the ACC/SCN First

Report on the World Nutrition Situation describes the origin of its data on childhood vitamin A deficiency:

> *"The rate of appearance of new cases (incidence) of severe vitamin A deficiency, measured as eye damage, was estimated in Indonesia at around 2.7 cases per 1000 pre-school children per year. This led to an estimate of up to 500,000 new cases of eye damage per year for Asia. Applying this rate to all countries with known vitamin A deficiency gives world-wide estimates of some 700,000 new cases per year, among pre-school children."* (ACC/SCN, 1987: 33)

Shortage

As in the previous section, we begin by presenting data on trends in availability and shortage by region, in this case of vitamin A and iron (Tables 15, 16). The source of these data is the ACC/SCN, which derives them from FAO's food supply data. Data are not available for iodine. For purposes of comparison, we reproduce in Table 17 the recommended dietary allowances (RDAs) for these micronutrients as presented by various institutions (data on iodine RDAs can be found in MDIS, 1993: 6, but, as data on supplies are not available, we did not reproduce them here). Table 18 shows the number of countries suffering from aggregate micronutrient shortages in each of the world's regions.

Table 1.15. Vitamin A Supply (RE/capita/day)

	1970	1980	1990
sub-Saharan Africa	1043	970	922
Near East & North Africa	527	704	851
South Asia	411	472	542
South East Asia	283	275	471
China	820	845	966
Middle America	567	661	731
South America	645	686	714

Source: ACC/SCN, 1993: 105. These trends are estimates based on FAOs food balance sheets.
RE is Retinol Equivalents.

The first and third columns of Table 17 reproduce the well-known RDAs for vitamin A and iron by the Food and Nutrition Board of the U.S. National Academy of Sciences, National Research Council (NRC). These RDAs constitute levels of intake judged adequate to meet the known nutrient needs of practically all healthy persons in the U.S.; they include an appropriate safety factor. The second column presents FAO-set iron requirements as reproduced by ACC/SCN. As can be seen, these figures are quite different from the NRC ones. In Table 18, we will set the cut-off point for aggregate iron shortage quite arbitrarily at 14 mg/capita/day, which seems to be a "safe" average level to supply all people with sufficient iron according to both estimates.

Table 1.16. Dietary Iron Supply, Vegetable and Animal sources (Mg/capita/day)

	1970	1980	1990
sub-Saharan Africa	17.3	16.8	16.6
Near East & North Africa	14.9	17.5	18.9
South Asia	14.6	14.3	14.1
South East Asia	10.1	11.5	10.8
China	11.5	11.4	11.7
Middle America	14.3	14.9	14.7
South America	13.5	12.6	12.3

Source: ACC/SCN, 1993: 105.

The fourth column is an adaptation of the NRC standards following Olson's observation that "the calculated RDA values for adult population in the U.S. are approximately 15% higher than the FAO/WHO levels for adults solely on the basis of the weight of selected reference individuals.... The need for vitamin A is presumed to be determined largely by mass." They thus constitute the adaptation of the NRC standards to Third World body sizes, and were calculated by subtracting 15% from the National Research Council's *adult* RDAs. In the fifth and sixth columns, we reproduce the vitamin A requirements supposedly more adapted to Third World circumstances proposed by the WHO/FAO. They are presented in a basal and a safe version, the first being the level below which serious deficiencies manifest themselves, and the second including "as well a suitable body reserve of vitamin A to meet periods of low intake and stress (Olson, 1991: 32)." Given the pernicious effects of even modest deficiencies in vitamin A, as well as the fact that two of the main factors that negatively affect vitamin A status are disease and parasites (from which poor people in the Third World suffer disproportionately), we believe it is necessary to use at the very least the "safe" estimates as the standard.

These data present a different picture than those for protein-energy

Table 1.17. Recommended Dietary Allowances for Iron and Vitamin A

	Iron mg/capita/day		Vitamin A RE/capita/day			
	NRC	FAO	NRC, "US size"	NRC, "non-US size"	WHO/FAO "basal"	WHO/FAO "safe"
infants	6-10	11	375	375	180	350
children	10	6.5-22	400-700	400-700	200-250	400
males	15	12	1000	850	300	500-600
females	12	17	800	680	270	500
pregnant/lactating	16-19	16	1200-1300	1020-1105	370-450	600-950

Source: For Vitamin A RDAs, see Olson, 1991: 33 and NRC data from Berkow, 1992: 938-9. For iron RDAs, see ACC/SCN, 1992: 45.

malnutrition. Sub-Saharan Africa has among the highest availabilities of both micronutrients. As elsewhere, averages hide exceptions and there are countries in this region that have extremely low average supplies of vitamin A per capita: for example Mozambique with 200 RE/capita/day, or Zambia with 290 RE/capita/day (ACC/SCN, 1992: 39). The situation of South Asia and South East Asia is especially dramatic.

If we apply the RDAs for vitamin A and iron set by the Food and Nutrition Board of the NRC and modified for non-U.S. populations or the "safe" WHO/FAO recommendations, and include some allowance for waste, apart from Africa and the Middle East, no region in the world has average availabilities of these micronutrients sufficient to be able to supply enough for all its population.

The trends in micronutrient shortage differ markedly, however, both between regions and micronutrients. For vitamin A, the trend is improving everywhere, except sub-Saharan Africa. For iron, on the other hand, the situation is alarming, as in three regions — sub-Saharan Africa, South America and South Asia — availabilities per capita are actually declining, and in all the remaining regions except the Near East and North Africa, they are stagnating.

Going beyond the level of regional averages, Table 18 shows that in 1989, 24 out of 78 countries for which data were available suffered from national vitamin A shortage, defined as an average availability of Retinol per person per day of less than 550 RE. Their combined population was 464.12 million people. In the same year, 21 countries, out of 71, suffered from iron shortage, defined as an average availability of iron per person per day below 14 mg. This represented a total of 1,988.9 million people — a very high figure, which is due to the inclusion of large countries such as China, Bangladesh, Indonesia, and Brazil. Note that every country in South East Asia for which data were available was iron-short.

Table 1.18. Number of Countries Where Micronutrient Availability Per Capita is Below Specified Thresholds, 1989

	Vitamin A (below 550RE/caput/day)		Iron (below 14mg/caput/day)	
	number of countries	population, million	number of countries	population, million
sub-Saharan Africa	15	123.76	13	116.04
South Asia	3	148.23	3	148.23
South East Asia	2	115.85	5	1436.28
Near East & North Africa	2	43.21	1	40.81
Middle America	3	12.56	7	38.03
South America	2	20.52	7	209.51
Total	27	464.12	36	1988.9

Source: ACC/SCN, 1993: 102-4

Micronutrient Deficiency

The WHO is the only organization publishing data on the incidence of micronutrient deficiencies. Table 19 provides data based on WHO tables which, unfortunately, uses different (and unusual) regional distinctions, making comparison with the previous tables difficult[xiv]. Moreover, its data are not historic, hence trends can be gauged only with extreme difficulty.

Table 1.19. Number of People in Millions Affected by Micronutrient Malnutrition

	Iodine		Vitamin A (pre-school children)		Iron
	at risk	goiter	at risk	xeroph-thalmia	anemia
Africa	181	86	18	1.3	206
Asia & Oceania	909	317	157	11.4	1674
Americas	168	63	2	0.1	94
Europe	141	97	0	0	27
Eastern Mediterranean	173	93	13	1	149
World	1572	655	190	13.8	2150

Source: For iodine, see MDIS, 1993: 5. For iron and vitamin A (as well as the older data for iodine), see WHO, 1991: 5 and FAO/WHO, 1992a: 15.

The category "at risk" of vitamin A deficiency in the Table 19 is defined as "the number of children living in areas where vitamin A deficiency and its consequences (blindness, increased mortality, decreased immunity) occur". (FAO/WHO, 1992e: 3)This is an overly large indicator of actual deprivation: not every child in these areas suffers from vitamin A deficiency. The other indicator — the number of preschoolers with xerophthalmia — is overly low as an indicator of undernutrition, because of the previously discussed fact that even sub-clinical deficiencies (*i.e.*, higher than the level of deficiency that brings about xerophthalmia) have important consequences for child morbidity and mortality. As a result, the actual number of vitamin A deficient pre-school children must be somewhere between 13.8 and 190 million.

We have two recent estimates of the number of vitamin A deficient pre-school children. According to a report prepared by the WHO for the International Conference on Nutrition (ICN), at least 40 million are vitamin A deficient. According to a global study of available epidemiological data by Humphrey, West, and Sommer (1992: 227), 124 million pre-school children worldwide are estimated vitamin A deficient (65 million are in just four countries: India, Indonesia, Bangladesh, and the Philippines). Note that all these data on vitamin A deficiency are partial, because they only apply to children of less than 6 years old; total numbers would increase greatly "if other age-groups in areas known to be vitamin-A deficient are included, such as school-age children and women of child-bearing age (ACC/SCN, 1992: 39)." However, since vitamin A deficiency has the severest impact on pre-school children, data are collected at that level.

Concerning iodine deficiency, Table 19 indicates that 29% of the world's population is at risk of goiter, while 12% actually displays its clinical manifestations. The former rate varies from 43% in the Eastern Mediterranean and 36% in Asia to 23% in the Americas (but nil for Canada and the US). Of all three micronutrient deficiencies, that of iodine is the one that most seriously affects Europe, with 27% of its population at risk (10 million in Germany alone) (MDIS, 1993: ix). These data constitute very significant increases compared to the previous estimates, made as recently as the 1992 ACC/SCN and WHO documents. This is largely due to a 1992 redefinition of the "at-risk" threshold by the International Council for the Control of Iodine Deficiency Disorders, with WHO and UNICEF. (*ibid*.) Note that iodine deficiency is usually highly localized, occurring especially in mountainous regions far from the sea. As a result, the above data distort reality: for most countries, pockets of deficiency exist, with prevalences of goiter as high as 50% and full cretinism at 1-5%, while the rest of the population is much less affected (ACC/SCN, 1987: 41).

Iron deficiency anemia touches approximately 40% of the world's population, ranging from 57% in Asia to 13% in the Americas to 3% in Europe. Premenopausal women are much more likely to be affected than men. According to the U.N., iron deficiency anemia touches approximately half of all women, and up to 79% of all pregnant women (in Africa and South Asia, for example) (ACC/SCN, 1993: 59). These data indicate a serious increase in its prevalence: previous estimates were that in 1980 only 30% of the world's population was affected by iron deficiency anemia (Millman *et al*., 1991: 12). This surge is due both to the improved quality of the reporting and to the fact that the availability of iron in most of the world's regions decreased or stagnated (Table 16).

HUNGER ATTENTION

Public attention to hunger and nutrition has increased greatly during recent years. Throughout the 1980s the debt crisis and structural adjustment, and more recently the environment, have dominated policy debates. Yet in the beginning of the 1990s the themes of hunger, food and nutrition moved again to the fore. The 1990 World Summit for Children set important nutrition-related goals (UNICEF, 1991). In 1991, the "Ending Hidden Hunger" Conference took place in Montreal — the first global intergovernmental conference ever specifically designed to deal with issues of micronutrients. In 1992, apart from the U.N. Conference on the Environment and Development (UNCED), which dealt tangentially with issues of hunger and food (chapters 14 and 32 of the "Agenda 21") (Reutlinger, 1993: 24), the International Conference on Nutrition was organized in Rome. This was the most significant forum to debate hunger since the 1974 World Food Conference. From this conference, an important set of goals and objectives emerged (see Messer, chapter 3 of this book). At the end of 1993, finally, the World Bank, for the first time in its history, organized a large conference devoted to hunger (see three background papers: Reutlinger, 1993; Walters, 1993; Webb & Von Braun, 1993).

The same years have seen the continued "complexification" of the phenomenon of hunger. More particular social factors in health and nutrition have been added to what used to be mainly an agricultural and political-economic problem. As understanding has increased, the myths and standard solutions of the past have been further undermined.

In the early 1970s, when hunger for the first time moved high on the international agenda, by initiative from the U.S. and the Group of 77, the World Food Conference was organized in Rome. At the time, the emphasis of both policy-makers and development specialists was on food production. It was generally believed that the world had inadequate food to feed its population and that the situation was becoming worse. The global food production shortfall and the simultaneous Asian and African famines of the years 1972-74 were considered the first dramatic warning signs of this trend. For that reason, the emphasis in research and international action lay on increasing food production and improving countries' and households' incomes. This included extension of the Green Revolution, establishment of international agricultural technology centers, national and international food stocks, and creation of the International Fund for Agricultural Development (IFAD) to increase small farmer productivity and production (Reutlinger, 1993: 13-20; Messer, chapter 3 of this book).

By the beginning of the 1980s, a new vision came to dominate first the academic world, then the community of development practitioners. It was heralded by Sen's *Famine and Poverty*, and essentially argued that hunger was not so much a matter of production as of distribution and access to food and, as such, of social relations (Sen, 1981, 1987; Dreze & Sen, 1989). This brought about a methodological inclusion of politics and anthropology, and a move away from exclusive stress on agronomy and economics.

Since the latter part of the 1980s, empirical research increasingly proves what some have been saying for a long time: hunger problems go beyond food availability or access to food. Indeed, an increasing number of studies show that even raising household incomes is not strongly associated with improved nutritional well-being (FAO/WHO, 1992c; Marek, 1992). Many other factors intervene and they are essentially of a public health nature, referring to both nutrition and care.

The new, complex and holistic approach to hunger is well summarized in the following quote on food security, extracted from the first theme paper of the International Conference on Nutrition:

> *"food security and nutritional well-being arising from food consumed by households is determined by at least five interrelated factors:*
>
> *– availability of food through market and other channels (...)*
>
> *– ability of households to acquire whatever food the market and other sources have to offer, which is a function of household income levels and flows and the resource base for subsistence farming*
>
> *– desire to buy specific foods available in the market or to grow them for home consumption, which is related to food habits, intrahousehold income control, and nutritional knowledge*
>
> *– mode of food preparation and to whom the food is fed, which is influenced by income control, time constraints, food habits, and nutritional knowledge*
>
> *– health status of individuals, which is governed by the nutritional status of the individual, nutritional knowledge, health and sanitary conditions at the household and community levels, and caretaking, among others."* (FAO/WHO, 1992b: 9)

It appears, then, that an increasingly complex and interdisciplinary picture of the causes of (and hence solutions to) hunger has emerged, one in which the old solutions — increase food production; increase poor households' incomes — are not sufficient, although still necessary, conditions for eliminating hunger. Public health interventions, dietary structures, systems of care, agricultural diversification and intrahousehold food control are also important elements. It is significant that the most recent worldwide event to put hunger high on the international agenda was labelled the International Conference on *Nutrition* , and not on "Food" or on "Hunger."

Parallel to this, increased attention is now being paid to issues of breastfeeding and deficiencies in iron, vitamin A, and iodine. In 1991, in Montreal, a conference on "Ending Hidden Hunger" focused exclusively on micronutrient deficiencies. Attention to micronutrients can also be gauged from increased efforts of data collection. Until now, no reliable or detailed international time-series existed on the prevalence of any of the three main micronutrient deficiencies, nor on others of emerging interest such as zinc or the B vitamins or magnesium. To be sure, computing these data on a worldwide level is difficult and presents many methodological pitfalls, but the same holds true for data on the incidence of protein-energy malnutrition, which has not stopped a variety of actors — the FAO, the World Bank, the ACC/SCN, UNICEF — from producing data. It is only now that improved data on micronutrient deficiencies are being published and that the WHO has begun, in collaboration with the University of Michigan, to create a global database on micronutrient deficiency prevalence and treatment (the Micronutrient Deficiency Information System [MDIS] of the WHO Nutrition Unit).

FOOD AID

Food aid is one of the main and most visible ways in which rich countries and their citizens provide relief and support to alleviate hunger in other parts of the world. As can be seen in Table 20, global food aid in 1991/2 and 1992/3 has remained high. In1991/92 it reached the highest level since the early 1970s, due to a one-million-ton hike in food aid to sub-Saharan Africa in response to a severe and widespread drought in its Southern and Eastern regions. This is generally considered a prime example of the effective use of food aid: millions of deaths and an economic catastrophe were averted through the timely and concerted delivery of food and financial assistance. For only the second time in its history, the World Bank financed emergency food imports to stave off starvation in Zimbabwe, Zambia, Malawi and Mozambique.

As column 3 shows, the proportion of global food aid going to Low-Income Food-Deficit Countries (LIFDCs) is stagnating at approximately 80%, significantly below the more than 90% that prevailed until 1990. This decline is essentially due to the new food aid to Eastern Europe and the former Soviet Union. Donors have always maintained that this food aid would not be at the expense of aid to "traditional" recipients. This has been the case apart from the first year, 1989/90, when some aid was probably diverted, as can be seen in column 5. Moreover, if food aid to the LIFDCs is computed as a proportion of world food aid minus Eastern Europe and the Community of Independent States (as we did in column 6), it will be seen that the trend has been much more stable. All in all, then, food aid to the East bloc has been in addition to "normal" flows, and donors continue to honor their commitment to the poorest and most needy countries.

This lends credit to those who hold that food aid is a reliable international transfer mechanism and a potential source of food security for many countries. It

Table 1.20. Cereal Food Aid Shipments by Region, 1982-1992

	(1) world, 1000 tons	(2) LIFDCs, 1000 tons	(3) LIFDCs as percentage of world	(4) Eastern Europe and former USSR, 1000 tons	(5) world minus Eastbloc, 1000 tons	(6) (2) as a percentage of (5)
1982/83	9238	8178	89	83	9155	89
1983/84	9849	9319	95	42	9807	95
1984/85	12511	11533	92	68	12443	93
1985/86	10949	10216	93	5	10944	93
1986/87	12552	11603	92	1	12551	92
1987/88	13609	12164	89	0	13609	89
1988/89	11326	9728	86	0	11326	86
1989/90	10913	7869	72	1492	9421	84
1990/91	12543	9869	79	1343	11200	88
1991/92	13904	10804	78	2059	11845	91
1992/93	12800	10200	80			

Source: WFP, 1993: 133. 1992-93 data are estimates from *Food Outlook*, July 1993: 2. LIFDCs are Low Income Food Deficit Countries.

does not mean, however, that food aid as presently administered by both donors and recipients fulfills that potential. Administrative delays, corruption, mismanagement, waste and misguided policies all contribute to limit the potential contribution of food aid to country and household food security.

HUNGER PREVENTION AND THIRD WORLD GOVERNMENT POLICIES

Hunger prevention implies economic growth, the main creator of entitlements for those who are hungry and poor. Global socioeconomic development is a long, slow process, but governments can adopt policies that address directly some of the causes and manifestations of hunger. Such "social" policies can be justified for reasons of equity and justice as well as investment in human resources (World Bank, 1990). They include, among others, primary health care, basic education, nutritional supplementation, food price stabilization, anti-famine policies and low military spending. In this section, we will present some indicators that attempt to quantify the extent to which governments have adopted effective and equitable social policies. Most of these indicators are relatively new, having been published by international organizations only since the early 1990s.

Government policies regarding malnutrition, hunger, primary health and similar issues are very hard to measure: declarations of policies and actual implementation often differ markedly, and data are few and unreliable in many Third World countries. International organizations such as UNICEF, the World Bank and others have periodically published overviews of policies adopted by governments on issues such as family planning policies and national programs of action for children (Mauldin & Lapham, 1985; UNICEF, 1993: 60-61). But these data tell us little about governments' real commitment to these policies and programs. The proportion of their budgets allocated to sectors such as health, nutrition, rural development and education, provide some indication of government commitment, but also these data leave serious questions about reliability. Even those governments spending a lot on health can do so inefficiently. They can allocate most of their spending to urban, "luxury" health facilities, for example, and neglect rural primary care — which may make the biggest difference for preventing hunger. As a result, interpreting these data remains difficult.

Finally, we can look at outcomes — *e.g.*, primary health indicators, nutrition variables and the like — and relate them to GNP per capita. This tells us something about the social quality and effectiveness of government policy. In 1989, the UNDP started its Human Development Report, which constitutes an attempt to do just that: relate social indicators to GNP per capita and draw conclusions about government policy. The Report contained a now-famous Human Development Index, composed of three indicators: life expectancy at birth, educational attainment and adjusted real GDP per capita. Since then, a variety of other international organizations established rankings of developing countries according to criteria of social policy.

Table 21 presents a series of indicators that attempt to measure social policies and outcomes. Column one represents countries' rankings on the usual GNP per capita indicator. This is an absolute ranking, allowing for comparison between countries. The next five indicators in the table are of the "new" type pioneered by UNDP: they compare different social variables with GNP per capita. This comparison can take two forms. Both of them are shown below. One,

developed by UNDP, is also used by IFAD. In it, the ranking of developing countries on the "new" composite indexes is compared with "traditional" GNP ranking. For example, if Saudi Arabia ranks 31st on GNP (meaning it has the 31st highest GNP per capita in the world), but only 84th on the human development index, it means its human development outcomes are, by international comparison, much worse than its GNP. This difference can be attributed to the regressive nature of its governmental policies. Three such indexes are shown in Table 21: the UNDPs Human Development Index; a composite Poverty Index from IFAD (1992: 460)[xv]; and the Physical Quality of Life Index, originally developed in 1979 by Morris Morris for the Overseas Development Council (Morris, 1979). In all three cases, we will present relative figures, *i.e.* the country's ranking on the new indicator minus its GNP per capita rank. For example, Angola's score of -28 on the Human Development Index means that its absolute score on that index was 22 (22-50=-28).

A second, more sophisticated, way of comparing social indicators to GNP has recently been developed by UNICEF. Researchers calculate the level of certain social indicators expected at specific levels of GNP per capita. They then compare actual levels of these indicators with the expected levels; the differences again inform us about the progressive or regressive nature of that government's policies[xvi]. Table 21 reproduces UNICEF's comparisons between GNP and under-5 mortality and child malnutrition. The last column shows one more indicator of government policy: military expenditure as a percentage of combined education and health expenditure. This indicator of "relative military spending" illustrates the relative importance attached by governments to these two sectors.

As can be seen, almost all Asian countries have negative scores on the preschool malnutrition indicator (*i.e.*, this ranking is lower than their ranking on GNP) which again confirms the phenomenon we described above. The Near East and North Africa all score negatively on the comparison between GNP and HDI, or PQLI meaning that their Human Development and Physical Quality of Life Index ranks are systematically below their GNP per capita. Similarly, most of Latin America has negative scores on the poverty indicator, suggesting disproportionate poverty at given levels of income per capita. A few countries (China, Myanmar, Sri Lanka) show highly positive scores on all or most of their relative indexes, while some others (Iran, Iraq, Liberia, Niger) display very negative results. Apart from these general observations, very little can be learned from the table. There are no correlations between the various indexes. In the UNDP data, the Philippines, for example, scores badly, with its Human Development Index 15 ranks below its GNP per capita.

Table 1.21. Ranking of Countries on Different Indicators [xvii]

	GNP rank	relative human development index rank	relative poverty index rank	relative PQLI rank	under-5 mortality gap	under-nourished pre-school children gap	relative military spending
sub-Saharan Africa							
Angola	50	-28	-17				
Benin	34	-22	-4	-19	-13		22
Botswana	74	-7	-13	-8	-26	0	16
Burkina Faso	17	-13	-15	-7	-12		100
Burundi	20	-1	-10	4	-2	-7	65
Cameroon	73	-30	5	-28	-47	7	44
Cape Verde	59	-2	17	6			
CAR	33	-16	-32	-12			39
Chad	4	7	36	6			150
Congo	69	-21	-51	-21		-7	51
Cote d'Ivoire	61	-23	27	-19	-32	8	12
Djibouti	41	-33	-10				
Eq. Guinea	36	-18	-13				125
Ethiopia	2	21	26	20	3	1	180
Gabon	106	-36	-5	-50			40
Gambia	16	-9	-9	-8			
Ghana	35	7	10	5	-37	-1	14
Guinea	43	-42	-21	-32			27
Guinea-Bissau	15	-6	2			15	
Kenya	30	17	16	20	69	14	42
Lesotho	40	14	11	9	-50	8	
Liberia	46	-16	47	-18	-93	5	24
Madagascar	14	32	36		4	-5	39
Malawi	8	12	-2	7	-57	11	41
Mali	18	-12	40	-9	-67	2	73
Mauritania	48	-35	-33	-27	-93	-25	154
Mauritius	97	13	13	-1	11	-9	4
Mozambique	1	14	25	7	-39		132
Niger	25	-20	52	-12	-167	-17	20
Nigeria	22	11	30	8	-36	-7	79
Rwanda	26	1	-23	-1	-60	-3	55
Senegal	57	-33	-32	-25	-58	3	51
Sierra Leona	24	-22	5	-19		9	15
Somalia	6	4	13	1			295
Swaziland	63	-5	-3	-9			13
Tanzania	5	30	30	29	50	-13	82
Togo	31	-2	49	0	-9	3	36
Uganda	21	7	-10	8	11	10	63
Zaire	7	27	5	32	-15		61
Zambia	23	21	-9	23	-71	1	92
Zimbabwe	56	-3	-13	3	15	9	91

	GNP rank	relative human development index rank	relative poverty index rank	relative PQLI rank	under-5 mortality gap	under-nourished pre-school children gap	relative military spending

Near East & North Africa							
Algeria	101	-35	-1	-19	-21	-1	22
Egypt	58	-7	32	-7	31	12	0
Iraq	80	-4	-31	-15	-94	0	0
Jordan	85	-10	19	-3	30	7	0
Lebanon	84	-12	24				
Morocco	64	-9	4	-12	2	5	70
Oman	112	-33	-16		-12		268
Sudan	47	-31	-38		-40	6	94
Syrian Arab Rep.	93	-4	-27	17	21		224
Tunisia	81	-7	26	-9	7	4	47
Turkey					-48		104
Latin America and the Caribbean							
Argentina	104	11	2	-1	8		78
Barbados	114	12	-1	0			
Belize	88	0	-40	9			
Bolivia	51	1	-38	1	-23	8	0
Brazil	100	0	-41	-15	-36	2	0
Chile	89	30	-27	11	18	11	67
Colombia	78	26	-3	7	35	4	29
Costa Rica	94	22	-3		26	9	6
Cuba	86	13	1		47		0
Domin. Rep.	60	18	10	15	20	7	0
Ecuador	76	8	-32	2	7	-1	0
El Salvador	70	-5	13	1	-2	3	0
Grenada	95	10	2				
Guatemala	68	-7	-41	-9	-6	-17	0
Guyana	39	30	-3	33			
Haiti	32	5	-16	3	1	-4	0
Honduras	67	-7	-14	5	48	-3	0
Jamaica	75	22	-55	24	37	6	0
Mexico	96	16	-22	-1	-4	-4	0
Nicaragua	65	-1	34	8	63	7	0
Panama	99	-1	-5	2	18	-5	0
Paraguay	77	6	-12	7	22	12	0
Peru	83	-3	-51	-7	-1		0
Trinidad Tobago	108	14	-13	-1	5	1	0
Uruguay	103	20	-5	4	10	3	48
Venezuela	107	7	-18	-9	9	2	0

Table 21 continued _____

	GNP rank	relative human development index rank	relative poverty index rank	relative PQLI rank	under-5 mortality gap	under-nourished pre-school children gap	relative military spending
East Asia							
China	27	55	78	41	95	8	0
Fiji	90	6	13				
Indonesia	44	19	23	16	-7	-16	0
Korea, Rep.	109	11	3	-4	9		0

In IFAD's first report on the state of rural poverty, the same country comes out very nicely, having a poverty index 28 points higher than its GNP rank. Brand new UNICEF data show that the Philippines has an under-5 mortality rate 29 points higher than expected at its GNP per capita, but a childhood malnutrition rate 14 points lower. The available data on the government's military spending show that it was high in 1975 (or alternatively, that social spending was very low). Yet, in the same sub-region, Myanmar, with higher military spending, scores better on the social indicators, while Indonesia, with lower military spending, scores worse. There is little to be learned from these indicators as they now stand.

For only 9 out of 84 countries did all five new composite indexes (human development, poverty, physical quality of life, under-five mortality and child malnutrition) have the same sign, meaning that all indexes point to the same progressive or regressive nature of policy outcomes. For 75 countries, signs differed, with as many as 28 cases ending in a 2-3 outcome. For these countries, then, it is very hard to form an opinion, based on these data, on the quality of their policy outcomes.

Moreover, the Poverty and the Human Development Indexes, which supposedly measure the same phenomenon and even share two constitutive indicators, are but moderately linked. In 58 cases, their signs were alike, while in 47 cases, they were opposite. Figure 6 represents graphically the relationship between both indicators: they are slightly linked as expected, but that relation is very weak (less than 10% of the variation in one is explained by the other).

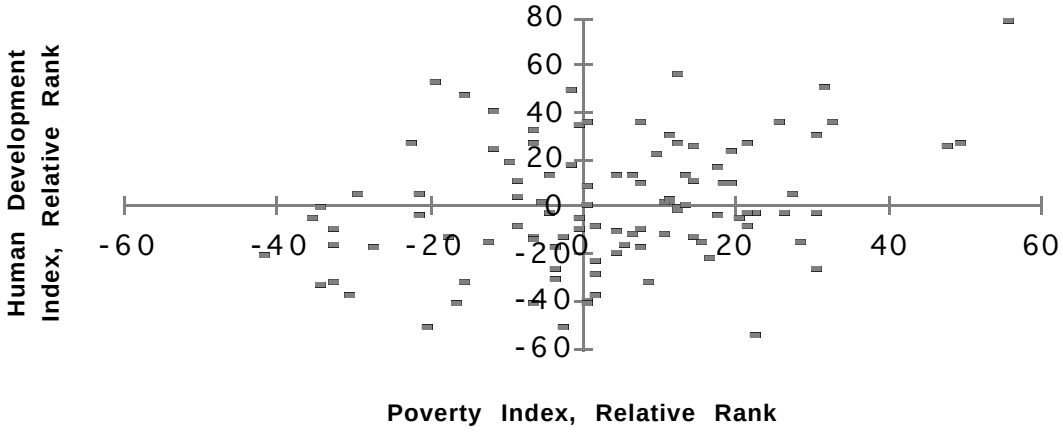

Figure 1.6. The Relation between Poverty and Human Development Index

The military expenditure indicator, which many consider causally linked with the quality of social outcomes, is totally uncorrelated with any of the indexes that measure social outcomes. In Figures 7 and 8, the relation between the Human Development Index and relative military spending is plotted. To avoid methodological bias, this was done for both absolute HDI ranks (Fig. 7) and relative HDI ranks, *i.e.*, compared to GNP (Fig. 8). In Figure 9, the relation between the same indicator of relative military spending is plotted against UNICEF's indicator of under-five mortality gaps. In each Figure, the arrow

indicates the theoretically expected relationship: the more countries spend on the military (or the less they spend on health and education) the lower their level of human development should be. Yet, the data in Figures 7, 8 and 9 show the result is the same in all cases: there is no relation whatsoever between relative military spending and any of these indexes that measure social outcomes.

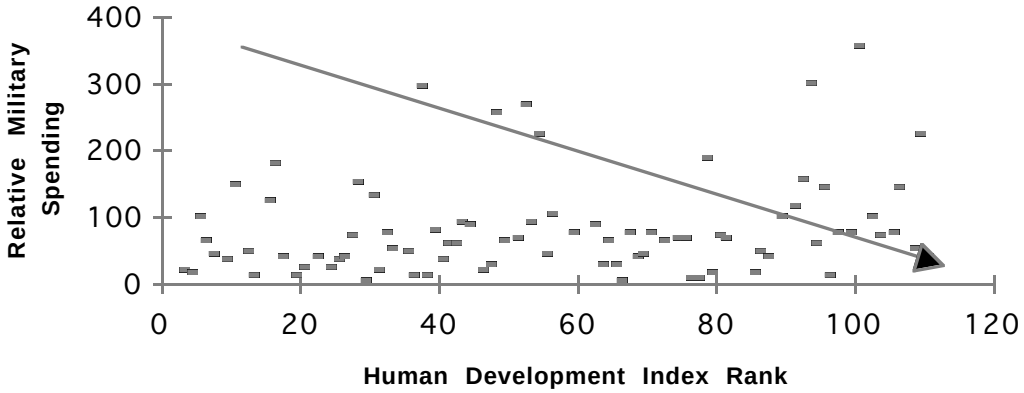

Figure 1.7. The Relation between Military Spending and the Human Development Rank

These results are disappointing, considering that these data constitute the latest and best the international organizations have to offer. This absence of causality or correlation could mean either that the expected relations are wrong (*i.e.*, that there is no link between high military spending and regressive social outcomes) or that the indicators do not measure what they pretend to measure. The latter could be the case for a variety of reasons. Some are methodological, having to do with the selection of indicators and the method of aggregation (the use of averages or means, of logarithms, ceilings and ratios instead of absolute figures, and the like). Moreover, independent, third factors intervene: wars, the epidemiology of disease, the climate, social traditions, and many more. These factors might explain both indicators and resolve the apparent inconsistencies now observed.

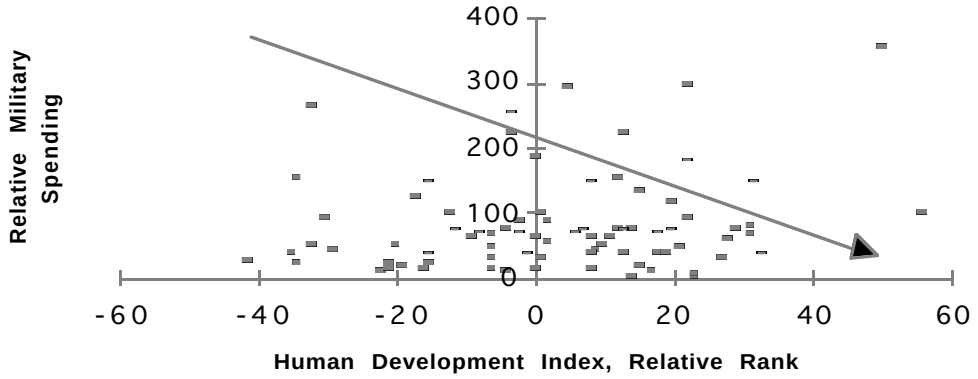

Figure 1.8. Relation between Military Spending and Relative Human Development Rank

Another explanation for the apparent lack of consistency between these new indicators could simply be that the data on which they are based are unreliable. Bringing together three or more unreliable indicators in one composite index can work either way: it can balance out the inaccuracies in the individual indicators or reinforce them. In the latter case, the resulting index is even more off the mark than its constituent parts. Finally, specific problems are associated with the use of ranks instead of absolute data for comparison. On the one hand, as we explained above, the absolute data are quite meaningless by themselves. They acquire significance only when compared with other countries (*i.e.*, put into ranking) and even more when confronted with income levels (*i.e.*, compared with

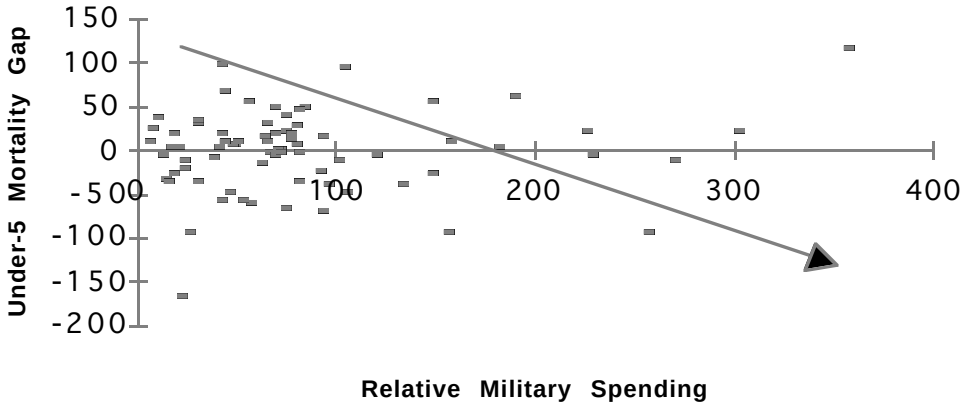

Figure 1.9. The Relation between Military Spending and the Under-5 Mortality Gap.

GNP per capita). On the other hand, this system penalizes countries with high GNPs, for it is impossible for them to rank much higher on their "new" indicator. If country "x" ranks 132nd on GNP, for example, and it has a fairly good social policy, it can easily improve its ranking on the other indexes by, say, 50 points. Country "y," in 23rd position, even if it has a very advanced social policy, could hardly move up more than 22 positions on the other indicator (this is why Figure 7 yields slightly better results than Figure 8).

Hence, in the final analysis, once the novelty wears off, these new indexes reveal very little. They amount to quite random aggregations of unreliable data, yielding very inconsistent results. At the most, they suggest that the explanation of social outcomes — among which the incidence of malnutrition — is an extremely complicated matter, not likely to be captured in one indicator. Each country's outcome is the result of a particular set of economic, political, historical, natural, epidemiological, religious and social factors, and meaningful comparison between countries is only possible by looking at data for all these factors (if they exist!).

Conclusion

The incidence and prevalence of hunger in the world are decreasing, although it is hard to be precise as to the exact numbers and proportions. National and international efforts to combat hunger are on the rise. These efforts are becoming increasingly comprehensive and complex, involving local communities and NGOs side by side with governments and donor agencies, and paying more attention to issues such as micronutrients and the health and sanitary environment. This should be cause for optimism: hunger can be combatted; the technical and political means to do so exist and can be mobilized.

On the methodological level, we possess a vast amount of data concerning food, hunger and malnutrition — without even looking at the data on agricultural production, food prices, yields, seeds, rural employment, population, or incomes (had we done so, this report could easily have become five times as long). Yet, notwithstanding the size of the "smorgasbord" of available data, it is very hard to form a clear or uncontested opinion on the precise state of hunger at any level. Most of these data measure slightly different things, at different levels of aggregation, or at different steps of the food chain. Other data, even if they measure the same phenomenon, are constructed in different manners (often unknown to the reader) by different institutions, using different time periods, different standards, or different geographical distributions. Finally, the reliability of the many data is low, as their methods of collection and aggregation are subject to serious methodological criticism and debate. As a result, there exist ample contradictions, both between data measuring different phenomena and those measuring the same.

Notes

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Income distribution

The above presented data on food povety employ a coefficient of variation to measure unequal access to food in each country. Indeed, once one knows how much food is available within the boundaries of a country, and how wealthy a country is, one still needs an idea of the inequality within that country, so as to account for the fact that various people have differential access to this quality of food. The coefficient of variation represents income inequality within a country. This makes sense: if in two countries the amount of available food as well as average GNP per capita were exactly equal, but one had an extremely skewed income distribution and the other a highly egalitarian one, there would clearly be more hunger in the former than in the latter. The coefficient of variationemployed in the above figures is specific for each country (although for may African countries there are no reliable data on income distribution). However, that coefficient is fixed in time: it does not change from 1970 to 1990. This might introduce a bias in the data, for there are few countries where income distribution has remained equal over time.

Few reliable data exist on income distribution; even fewer are data series that are comparable over time. An overview of some of the few reliable data we found provides the following picture[xviii]. Income distribution seems to have improved in Costa Rica, Colombia and Taiwan for the last 30 years, as wel as in South Africa, the Philippines, Malaysia and South Korea in the 1980s. On the other hand, there is general agreement that income distribution worsened since Independence in Bangladesh, India (with possible stability in the second half of the 1980s), in Malaysia during the 1960s and the 1970s, in China since economic liberalization began, in Brazil and Peru throughout the last 30 years, in Mexico in the 1980s, and in most of the former East bloc both in the years before and after the collapse of the Berlin Wall.

If this is true, then the possibility exists that the improving trend observed in the food poverty data is overstated. Indeed, the countries in which income distribution worsened are larger and more in number than those where income distribution improved, especially during the 1980s. As a result, the trends in food poverty for these countries might be overly optimistic.

One factor that could significantly impact on food poverty data is changes in income distribution. Indeed, even if one knows how much food is available within the boundaries of a country, and how wealthy a country is, one still needs an idea of the inequality within that country, so as to account for the fact that various people have differential access to this quality of food. The above data are calculated by the use of a coefficient of variation which represents income inequality within a country. This coefficient is fixed in time: it does not change from 1970 to 1990. This might introduce a bias in the data, for there are few countries where income distribution has remained equal over time.

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[i]. This conclusion is supported by looking at UNDP's "food import dependency ratio", defined as "the ratio of food imports to the food available for internal distribution: that is, the sum of food production, plus food imports, minus food exports:" UNDP, 1993: table 13 and page 224. The higher the level of human development of countries, the

higher their food import dependency. In 1988/90, "high human development" countries had a 36.4% food import dependency ratio; "medium human development" countries 10.4%; and "low human development" ones 7.8%. In other words, and contrary to the spontaneous, almost emotional appeal of "food first" strategies, low food import dependency goes hand in hand with low quality of living.

[ii]. An important illustration of the vulnerability that results from food import dependency is the case of Iraq. As John Field, 1993, has pointed out in a most interesting recent article, Iraq's food security, prior to the Gulf War, was very high, resulting from high imports of food and domestic subsidization for consumption. Due to the embargo, however, the system totally collapsed, and the incidence of undernutrition soared.

[iii]. Subnational differences are extremely difficult to apprehend, and are rarely, if ever, represented in the available data. Yet, disaggregation on the subnational level can yield very different results, as the extreme cases of South Africa and the U.S. show. UNICEF, 1993b: 13 has an interesting piece on the hidden disparities behind national under-5 mortality rate data. UNDP, 1993: tables 9 and 10 attempts to address this problem, with indicators on female-male gaps and rural-urban gaps.

[iv]. Data for 1981 from World Bank, 1984: table 24. Population data from World Bank, 1993: table 1. A similar table has been developed by IFAD, 1992: 32. It contains a table containing the 27 countries "with positive growth (1965-85) of per capita DES [but] failing to meet minimum caloric requirements in 1985." This list includes both India and Pakistan; the other countries are small to very small.

[v]. This methodological modification runs counter to the trend over the last decades. In the past, every time the FAO or the World Bank re-computed their data on global malnutrition, their cut-off points decreased. This process has *inter alia* been described by Millman & Chen, 1991: *passim*, Millman *et al*., 1991: 3-4, Poleman, 1983: 42 ff. and Warnock, 1987: 5. From 1950 to 1985, the "reference person" (the ideal food consumer with whom a person is compared to establish if that person is undernourished) consumes 500 calories and 21 grams of protein less! According to data shown in Avery, 1991: 31, the decline since 1946 is around 1,000 cal/day.

[vi]. According to the FAO, 1992a: 7, "Fifth World Food Survey approach of adopting the lower limit of the range of acceptable body-weight for height is considered as unduly conservative and in the current assessment this has been replaced by the median value." In other terms, in the new data, the cut-off point for children has been augmented further.

[vii]. See too Webb & Von Braun, 1993: 10. This also holds for the United States. If one accepts Larry Brown's estimate that 13% of all Americans are hungry, this corresponds surprisingly well with the data calculated by the Bureau of the Census of the Department of Commerce, on the proportion of the U.S. population living below the poverty level, which is 13.4%. Bread for the World, 1991.

[viii]. A United Nations term, referring to food-deficit countries with per capita income below the level used by the World Bank to determine eligibility for concessional assistance from the International Development Association (*i.e.* U.S. $ 1235 in 1991). All the countries in Table 11 are LIFDCs.

[ix]. According to Ghai et.al., 1988: 18, for Africa there is only one country (Egypt) that has complete data on infant mortality for a recent year. For all other countries, UN data are estimates.

[x]. According to Svedberg, 1991: 128, "the FAO estimates of the availability of calories for human consumption in the African countries are built on shaky grounds and therefore very unreliable and there are at least three reasons to expect that there is a net downward bias in these estimates." According to Raikes, this downward bias is increasing over time: Raikes, 1988: 20, 62. See too Uvin,1994: 44.

[xi]. This is the position adopted by the FAO, as described in the ACC/SCN, 1993: 94 ff. This leads to some problems, which can only with difficulty be assumed away, witness: "the

interpretation of such a vastly different slope is that the underweight prevalence in South Asia (...) is much higher at a given level of kcals/caput/day [than elsewhere in the world — PU]." .. This meant that "certain undefined regional differences explain the differences in national prevalences" (p. 96).

[xii]. Note that, in the past, data for India were calculated by comparing to a lower, Indian reference standard for children. Doing so brought world child malnutrition rates down by as much as 5%. See Millman and Chen, 1991: 11. The new data, presented in this text, use the same standard for India as for all other countries. The same holds within countries: using the WHO standard versus a local one, infant malnutrition in the Philippines is 34% versus 14%. See UNICEF, 1992 c: 46.

[xiii]. The results of a number of recent studies of children's stunting now point to micronutrient deficiencies, particularly vitamin A and iron, as factors. A long-term three country study (Egypt, Kenya, Mexico), for example, came to an unexpected conclusion that the overall stunting observed in all three countries was explicable to a large extent by inadequate micro-nutrient intakes. All the effects of micro-nutrient deficiencies detailed above were found in the three sites, including retardations in motor, psycho-social and cognitive development. Nutrition Collaborative Research Support Program, 1992: 119.

[xiv]. Africa in this table equals sub-Saharan Africa elsewhere (except inclusion of Algeria and non-inclusion of Somalia). Eastern Mediterranean includes all of Near East and North Africa (except Algeria) and countries such as Afghanistan, Iran, Pakistan and Somalia. Americas includes the U.S. and Canada. Asia includes all of Asia (except for some countries that are included in Eastern Mediterranean) as well as Australia, New Zealand and Japan.

[xv]. Containing weighted data on GNP, GNP per capita, GNP per capita growth rate, percentage of rural population below poverty line, and life expectancy at birth. The Human Development Index also includes life expectancy at birth as well as per capita GDP. As a result, IFAD's poverty index includes two of the three indicators that constitute UNDP's Human Development Index. The method of constructing the index is different, however. UNDP uses a log of GDP per capita, up to an international poverty line, while IFAD uses an income-gap ratio, in which GNP per capita of a country is deduced from the GNP per capita of Cyprus. As to life expectancy at birth, UNDP uses absolute data, while IFAD employs a similar income-gap technique to calculate a ratio, this time with Cuba's life expectancy as the ceiling.

[xvi]. As UNICEF, 1993b: 10 explains: "an average-performing country with a per capita GNP of $ 400, for example, could be expected to have an under-five mortality rate of approximately 140; if the actual under-five mortality rate is 120, then that country's national performance gap is +20, meaning that its under-five mortality rate is 20 points better than expected for its GNP per capita."

[xvii]. Column 1 from World Bank, 1993: table 1. Columns 2 and 4 from IFAD, 1992: table 1, 2. Column 3 from UNDP, 1993: table 1. Columns 4-5 from UNICEF, 1993b: 50. Column 7 from UNDP, 1993: table 28.

[xviii]. Chen, Datt & Ravallion, xxx; Datt & Ravallion, xxx; Ravallion, xxx; Weisskopf, xxx; Pastor, xxcx; Anand & Kanbur, xxx; Howes, xxx; Fields, xxx