

PA-ABG-856  
ISN 64512

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# Medium Term Estimates of Demand-Based Food Aid Requirements and Their Variability

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Reprinted from  
*Food Aid Projections for the Decade of the 1990s*  
National Academy Press, 1989



Reprint No. 177

# Appendix A

## Medium Term Estimates of Demand-Based Food Aid Requirements and Their Variability

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### 1

## Introduction

### SCOPE OF STUDY

This study of the likely program food aid requirements of developing countries in the medium-term future is a follow-up of the earlier study entitled *Medium Term Estimates of Food Aid Needs and Their Variability* (Ezekiel, 1988).

The main objectives of the present study are:

- (1) to update the estimates on the basis of more recent data;
- (2) to extend the estimates up to the year 2000; and
- (3) to bring about such improvements in the scope and methodology of the estimates as might be feasible.

In part 1, the report summarizes the basic methodology adopted in the study and also presents the changes in scope and methodology that have been made in the present study. In part 2, the report presents the new estimates of program food aid requirements for future years, extending to the year 2000, that have been obtained for all the developing countries covered as well as separately for low-income developing countries. In part 3, the report discusses the estimation of the variability of food aid requirements and presents new estimates of variability for individual countries and for regions and sub-regions. It also presents the results for the variability of food aid requirements for regions and sub-regions when food aid is assumed to be provided only to low-income countries.

### NATURE OF FOOD AID

Food aid can be of different types. It may be (a) program food aid, (b) project food aid, or (c) emergency food aid. Various special types of food aid, including food aid for building security food stocks or for supporting adjustment programs of various kinds,

can be classified into these types. This study makes estimates of the *program* food aid requirements of developing countries up to the year 2000, while recognising that there are important relationships between it and other types of food aid.

Program food aid is intended for sale in the markets of developing countries. The object of such aid is to meet unsatisfied demand at some explicit or implicit level of prices. The demand-supply gap at those prices arises because the demand for food tends to grow at a faster rate than domestic production and the capacity of developing countries to import food on a commercial basis to fill this gap is limited. Sharp increases in population and some increases in per capita income raise the demand for food rapidly. At the same time, scarcity of resources and the difficulties involved in developing appropriate new technologies and bringing them into use prevent food production from rising quickly. The same factors prevent an adequate increase in foreign exchange earnings, which in any case also have to satisfy other important developmental needs.

Food aid is a resource. While filling existing demand-supply gaps in any given year, it should therefore promote development so as to raise incomes and food production in the future at a faster rate. This becomes particularly important in determining the required volume of commercial imports for estimating program food aid needs. When food aid substitutes for commercial imports, it saves foreign exchange. When it is additional to such imports, it generates domestic currency resources. Both of these play a very important developmental role. The volume of food that a country should be expected to import commercially in relation to its food import gap is therefore a policy variable and should not be determined merely from the past behavior of such imports.

## ESTIMATION OF FOOD AID REQUIREMENTS

In this study, food aid requirements are defined as that part of the food import requirements of developing countries determined at a reasonable price level that are not filled by commercial food imports. In turn, food import requirements are defined as the gap between total domestic use (TDU) and the total domestic production of food. The food import gap is estimated by projecting past trends either in the variables themselves or in the variables on which they depend. Commercial food imports cannot be determined in this way. The reasons for this are briefly discussed below. The approach adopted is set out there. For any single year, changes in stocks also affect the picture. In the long term, however, such changes tend to offset one another. It is assumed that they would not affect the trend estimates that are made here.

Food is defined to cover the major staple foods in each country. These include both cereals and non-cereals. All of these are measured in terms of their cereal equivalents. This framework assumes free substitutability between different staple foods in terms of cereal equivalents. In particular, it assumes that the import gap obtained by deducting the production of staple foods in cereal equivalent from total domestic use of staple foods in cereal equivalent can be filled by cereal imports irrespective of the actual composition (in staple foods) of the calculated gap. This assumption is carried forward to food aid needs, which are measured by the difference between the food import gap and commercial cereal imports.

Production is projected for future years at trend rates of growth for each of the staple food crops.

Total domestic use of staple foods is the sum of the (1) food use, (2) feed use, (3) seed use, and (4) waste and other uses of staple foods.

The *food use* of the staple foods is taken, depending on actual consumption patterns in

different countries, as the sum of the food use of (i) cereals, (ii) root crops, (iii) pulses (iv) groundnuts, and (v) bananas and plantains. Estimates of per capita consumption of each of these staple food groups are obtained for future years at five-yearly intervals by *applying*

- (1) trend rates of growth of per capita GNP, *and*
- (2) FAO projections of the relevant income elasticities of demand at five yearly intervals, *to* the respective estimate of trend per capita consumption in 1983.

The per capita food use of all staples is then obtained by summing the separate per capita estimates for each year. This sum is multiplied by the population in that year—as estimated by the UN in its medium variant projections—to obtain the total food use of all staples in those years.

The *feed use* of all staples in various years is estimated in basically the same way as the separate components of food use, using the income elasticity of the demand for meat as a proxy for the income elasticity of the demand for feed.

The *seed use* of staples is estimated by applying the proportion of seed use to production prevailing in a base period to the production estimates of the various staples in different future years.

The *other uses* of staples, consisting of industrial uses and wastes, are estimated by applying the proportion that such uses formed to the sum of food and feed use in the base period to the estimated sum of food and feed use in different future years.

These estimates of the various uses of all staples are then summed for each future year to obtain the required estimates of total domestic use. The method followed in making these estimates of total domestic use is basically the same as that adopted in Leonardo Paulino's study at IFPRI of food trends and projections (Paulino, 1986).

In general, the estimates of production trends make use of the time-series data formed by aggregates of country estimates for past years. Following the approach of previous IFPRI studies, a semi-logarithmic trend equation is fitted to the data of different variables to obtain the respective growth rates.

## THE BASIC MODEL

In this section, an attempt is made to provide an algebraic representation of the approach underlying these estimates that has been described above. The general equation fitted to each data set is:

$$Y_t = e^{a+bt} \quad (1)$$

where  $Y_t$  = estimate of the variable in year  $t$   
 $a$  = constant term (the logarithm of the variables estimate for  $t = 0$ , the base year)  
 $b$  = logarithm of the value of one plus the annual rate of change of the variable  
 $t$  = period in years, starting from the base year

The equation can be replaced by its equivalent:

$$Y_t = Y_0(1 + r)^t \quad (2)$$

where  $Y$  = the value or estimate of the variable  
 $t$  = the year of the estimate  
 $r$  = the annual rate of change of the variable

For the population and production variables, an equation of this form can be used to derive—or to represent the derivation of—the relevant estimates. However, consumption is not derived from the rate of growth of consumption. For two of its four components—food use and feed use—it is derived from the rate of growth of per capita GNP and the relevant income elasticity of demand. Therefore, in equation (2) for computing food and feed use,  $r$  is replaced by the product of these two. Where the elasticities are available at five-yearly intervals, estimates are obtained through a step-wise process, with the results of each five year projection forming the base for the next five year calculation. An estimate of waste and other uses is obtained as a proportion of the sum of food and feed use, while seed use is taken as a proportion of production.

Aggregate food aid needs are then given by the equation:

$$F_{at} = N_o(1+r_N)^t \sum_{n=1}^5 (1+x_n)[C_{n1o}(1+r_Y e_{n1})^t + C_{n2o}(1+r_Y e_{n2})^t] - \sum_{n=1}^5 (1-y_{nt})P_{no}(1+r_{Pn})^t - M_t \quad (3)$$

where:

C = consumption (total domestic use) of staple foods in cereal equivalent.

F = food aid requirements in cereals

M = commercial imports of cereals

N = population

P = domestic production of staple foods in cereal equivalent

Y = per capita GNP

and where:

a = aggregate

e = Income elasticity of demand

n = different staple foods (n = 1 .... 5)

n1 = food use of each staple food

n2 = feed use of each staple food

r = rate of growth of variable

t = the number of the year, with the base year being zero

x = the proportion of waste and other uses of a staple food to the total of the food and feed uses of that staple food.

y = the proportion of seed use to aggregate domestic production of each staple food.

The first two of the three terms on the right hand side of this equation represent the computation of the food import gap. Food aid requirements are obtained by deducting commercial cereal imports from that gap. Given the import gap estimate, the estimate of food aid requirements depends on the assumptions made regarding commercial cereal imports. However, the estimate of food aid requirements ultimately depends as much on the food gap itself and therefore also on the first two terms of the equation. What this equation brings out is that aggregate food aid requirements in cereal terms depend on:

- (1) the base year levels of population, consumption and production,
- (2) the rates of growth of population, per capita GNP and production,
- (3) the income elasticities of demand for various staple foods for both food and feed uses,
- (4) the proportion of food and feed uses that is covered by waste and other uses,
- (5) the proportion of seed to production,
- (6) the volume of commercial cereal imports.

Of critical importance among these are the rates of growth, the income elasticities and the volume of commercial imports.

## CEREAL EXPORTS AND COMMERCIAL CEREAL IMPORTS

Some developing countries which have a food import gap and even some which are unable to fill this gap with commercial cereal imports nevertheless export a part of their domestic food production. Such exports may consist of cereals differing in type or quality from the imported cereals. Also, exports could take place from one region or at one time, while imports occur in another region or at another time. The fact that these countries export cereals reflects the complex nature of food, which is not only essential for life but is also a commodity like any other. It is, therefore, assumed that such exports would continue and even grow—at the rate of growth of production.

Since demand based food aid requirements are estimated by deducting commercial food imports from the food import gap, it becomes necessary to generate an estimate of commercial imports. However, without a clear conception of the policy-related nature of demand-based food aid requirements, and, therefore, without any statement of the policy objectives underlying the provision of food aid for sale in the market, earlier studies were not able to provide a rationale for determining the extent to which commercial imports of food should fill the food import gap in order to determine the residual requirement for food aid. Each of these studies devised rules for determining the volume of a country's commercial imports, but presented no real justification for them related to the nature of food aid and its objectives. Commercial imports were obtained in some studies as proportions of import gaps or of foreign exchange earnings. In others, they were estimated on the basis of a function showing the relationship between commercial cereal imports and other variables such as foreign exchange earnings, foreign indebtedness, and domestic and international food prices.

There are three major methodological difficulties with this approach. First, there is the difficulty involved in obtaining functions that are really satisfactory in explaining the past behavior of commercial food imports. Although many such functions have been used, their statistical quality is often doubtful. Sometimes even the signs of the relationship are wrong and in most cases the explanatory power of the selected function is quite limited. Second, there are the problems that arise in using these selected functions for predictive purposes. These arise because to use them in this manner it is necessary first to predict the future values of the explanatory variables themselves. This is not at all easy to do. Complex functional relationships may be needed in turn to explain these variables or strong assumptions about future developments may have to be made or both. In some cases, highly sophisticated and complex models have been used to predict some of these variables on a medium term basis, but with little success. Third, there are the analytical and statistical difficulties that arise because the availability of food aid itself affects these proportions and relationships, so that it must also be used to explain commercial food imports (and therefore food aid requirements).

There is a more basic difficulty about adopting this approach. These countries have tended to handle their problems in the past in particular but different ways. Under this approach, they are, therefore, required to handle their problems in the same way in the future, irrespective of any effects this may have on their economies. One country may have used a relatively large proportion of additions to its foreign exchange earnings to meet its food import needs in the past even though as a result it has not been able to promote its development at an adequate pace. It will be expected to continue to do so in the future and

will be given less food assistance from abroad. Some other country that has used less of its foreign exchange earnings to meet its food needs will be allowed to use less of these earnings for this purpose in the future and will therefore be given more assistance.

The usual justification for using different proportions or functions based on past behavior is that they measure the capacity of countries to import food commercially. However, what any of these rules measures at most is the *willingness* of countries to use their import capacity to finance commercial imports of food. The *capacity* of countries to import food commercially depends on the growth problems they face and the contribution that foreign exchange earnings can make to their development if not required for food imports. These are not taken into account.

To try to establish a better basis for estimating commercial food imports, it is important to recognize that food aid requirements do not exist independently of donor policy and that such policy must be development oriented. In determining the volume of a developing country's commercial imports, therefore, such a development-oriented policy must not look at what that country is likely or willing to do but what, from a development point of view, it would be reasonable to expect it to do. For one country, it may not be reasonable to expect it to import as much food commercially as past experience indicates it may be willing to, while for another country, it may not be reasonable to expect it to import as little food commercially as it may be willing to. It is necessary to develop independent criteria for what quantity of food it would be reasonable to expect a country to import commercially. Such criteria should be uniformly applicable to all countries.

Since food aid is a development resource, the search for such criteria should be conducted in the area of possible links between the volume of the country's future commercial food imports and its growth. Logically, this is a two-way relationship. Commercial cereal imports should be determined with reference to some measure of the anticipated growth of the economy, while at the same time, consideration should be given at least in a qualitative way to the impact that is produced on the economy by the volume of commercial imports that each chosen measure would require.

A suitable basis for estimating future commercial food imports is provided by each country's actual commercial cereal imports in a base period. To avoid the erratic influence of year to year variations in such imports, it would be desirable to use an average of actual imports over a period. A five-year period was used.

Three estimates were made. An initial or high estimate was obtained by keeping net commercial cereal imports, that is both gross imports and exports, constant at the base period level. A second or low estimate was obtained by raising gross commercial imports at the rate of growth of aggregate GNP, while exports were assumed to grow at the rate of growth of domestic food production. A third or basic estimate was obtained using the same method for exports but increasing gross commercial imports at the rate of growth of per capita GNP. Subsequent analysis is based entirely on the results obtained by the basic method.

## CHANGES IN SCOPE AND METHODOLOGY

The underlying data on food consumption and production used in the present study are drawn from the latest available *Supply Utilization Accounts Tape* of the FAO, which provides fully reconciled data through 1983. The earlier study was based on similar data through 1980.

The earlier study made estimates of food aid requirements for the period 1985 through 1990, that is for a period five to ten years from the last year of the then underlying data

series. The present study makes estimates for the period 1990-2000, that is for a period seven to seventeen years from the last year of the new underlying data series.

Two major changes have been made in the methodology used in the projections:

- (1) Short-period rather than long-period trends in the underlying variables have been used in making projections;
- (2) The minimum and maximum constraints on income growth rates and the minimum constraint on rates of growth of food production have been dropped.

In the previous study, the trends in the underlying consumption and production variables used for making projections were drawn from the entire twenty year period, 1961-80, for which data were available. In the present study, the trends in the underlying variables have been drawn from the twelve year period, 1972-83, that is from the second half of the twenty-three year period, 1961-83, for which data are available. An independent study of the behavior of food consumption and production in developing countries shows that there have been sharp changes in trends between the first and the second halves of this period. The short period trends are, therefore, likely to give a better indication of likely behavior of these variables in the future.

For the same reason, for income, short period rates of growth as given in the *World Bank Atlas, 1986* have been used in the present study instead of the long period rates of growth as given in the *World Development Report, 1984* that had been used in the earlier study.

In the earlier study, the rate of growth of per capita GNP was subject to a constraint on the maximum rate of 6.0% and on the minimum rate of 0.5%. The minimum constraint was particularly important because many countries have lower and even negative rates of growth of per capita GNP. Similarly, the rate of growth of food production was subject to a minimum constraint of nil. Many countries have negative growth rates of food production. These constraints on growth rates of income and food production have not been dropped.

One other important change that has been made in the present study relates to the classification of countries by income. In the earlier study, countries were divided into four classes by their income level in 1983. In this study, countries have been regrouped into five income classes. The first two classes have been retained unchanged. A new third class of income between \$500 and \$800 has been created. The fourth income class then runs from \$800 to \$1500, with all other countries having per capita incomes above \$1500 falling into the fifth class. When dividing countries into low income and high income countries, a new dividing point has been set at \$800 instead of the dividing point of \$500 used in the earlier study.

## 2

### Trend Estimates

#### HIGH AND LOW ESTIMATES

As in the earlier study, an initial estimate of food aid requirements was made for 85 developing countries on the assumption that net commercial imports are held constant at the average level of the base period. The base period for this purpose was taken at 1979-83,

the latest five year period for which the relevant data are available on a uniform basis for all the countries covered. The total estimated food aid requirements of 85 developing countries rise from 45 million tons in 1990 to over 70 million tons in 1995 and almost 99 million tons in 2000 (Table 2.1).

This estimate is the high estimate of program food aid requirements since it makes the extreme assumption that developing countries will not increase their commercial cereal imports at all over the base period. The food aid requirements, therefore, increase with the food import gap. It would be reasonable to expect developing countries to increase commercial imports as their economies grow over time. The issue is what criterion to use for determining this growth. This criterion cannot be found in the growth of the import gap—for example by assuming that commercial imports form a fixed proportion of the import gap—since the import gap is a measure of the problem rather than of the capacity to handle it. If food aid is to be growth related, this criterion should be found in the rate of income growth.

The second method used for estimating program food aid assumed that the gross commercial cereal imports of each developing country increase from their base period level at that country's rate of growth of aggregate GNP. Any cereal exports are assumed to grow from their base period level at the rate of growth of food production, so that the proportion of exports to food production remains constant at the level prevailing during the base period. This yields a low estimate of food aid requirements. The results show the estimated program food aid requirements of 85 developing countries rising from 31 million tons in 1990 to over 42 million tons in 1995 and almost 54 million tons in the year 2000 (Table 2.2).

### THE BASIC ESTIMATE

The rate of growth of aggregate GNP, used in the second method to raise gross commercial cereal imports from their base level, is the sum of the rates of growth of population and per capita GNP. The increase in total food consumption that occurs because of the sharp increase in the rate of growth of population is the principal source of the food problem that food aid tries to meet. While food consumption also rises with increases in per capita income, this latter growth also reflects the increasing capacity of the developing country to handle its problems. By using the rate of growth of aggregate GNP to determine the growth of commercial cereal imports, the second method includes a large component of such growth that really measures the size of the country's food problem rather than its capacity to handle it.

The third method of estimating program food aid requirements, therefore, uses the rate of growth of per capita GNP for increasing commercial cereal imports from their base period level. This method yields food aid requirements that are intermediate between those yielded by the first and second methods. In that sense, this method yields moderate results. It is, however, treated as the basic method in this study not for that reason but because it provides the most appropriate simple method of determining how the capacity of developing countries to import cereals commercially grows over time.

By the third or basic method, the estimated food aid requirements of 85 developing countries increase from 37 million tons in 1990 to 55 million tons in 1995 and to almost 74 million tons in 2000 (Table 2.3). In examining these results obtained by the basic method, two features need to be kept in mind. One, these are estimates of program or demand-based food aid requirements and do not, therefore, measure the growth of project or need-based food aid requirements, which may behave quite differently. Two, in making these estimates,

TABLE 2.1 High Estimate of Food Aid Needs (Method 1)

REGION	1990	1991	1992	1993	1994	1995	2000
..... in million metric tons .....							
SOUTH ASIA	2.53	2.63	2.73	2.83	2.94	3.06	3.07
EAST ASIA	5.61	6.16	6.73	7.32	7.93	8.56	11.34
ASIA	8.14	8.78	9.46	10.15	10.87	11.61	14.40
WEST ASIA	4.26	4.78	5.33	5.90	6.50	7.14	10.74
NORTH AFRICA	16.32	17.99	19.74	21.58	23.52	25.56	36.73
W. ASIA/N. AFRICA	20.58	22.76	25.06	27.48	30.02	32.70	47.47
WEST AFRICA	3.45	3.83	4.22	4.62	5.04	5.47	7.88
CENTRAL AFRICA	1.54	1.75	1.96	2.18	2.41	2.64	3.97
EAST AFRICA	7.37	8.22	9.09	9.98	10.90	11.84	16.93
SUB-SAHARAN AFRICA	12.36	13.79	15.27	16.78	18.35	19.95	28.78
CENTRAL AMERICA	1.62	1.73	1.85	1.96	2.09	2.21	2.85
SOUTH AMERICA	2.69	2.92	3.14	3.37	3.61	3.88	5.22
LATIN AMERICA	4.31	4.65	4.99	5.34	5.69	6.09	8.07
<b>TOTAL</b>	<b>45.39</b>	<b>49.99</b>	<b>54.77</b>	<b>59.75</b>	<b>64.93</b>	<b>70.35</b>	<b>98.72</b>

Note: Net Commercial Imports are held level at the 1979-83 Average.

TABLE 2.2 Low Estimate of Food Aid Needs (Method 2)

REGION	1990	1991	1992	1993	1994	1995	2000
..... in million metric tons .....							
SOUTH ASIA	2.36	2.43	2.50	2.57	2.64	2.72	2.52
EAST ASIA	1.22	0.97	0.68	0.47	0.42	0.35	0.03
ASIA	3.58	3.40	3.18	3.04	3.06	3.07	2.55
WEST ASIA	2.11	2.24	2.37	2.51	2.65	2.79	3.35
NORTH AFRICA	10.48	11.06	11.64	12.24	12.84	13.45	15.72
W. ASIA/N. AFRICA	12.58	13.30	14.02	14.75	15.49	16.24	19.07
WEST AFRICA	3.10	3.42	3.75	4.10	4.45	4.82	6.86
CENTRAL AFRICA	1.31	1.48	1.65	1.82	2.00	2.19	3.22
EAST AFRICA	7.00	7.79	8.59	9.42	10.27	11.14	15.87
SUB-SAHARAN AFRICA	11.41	12.69	14.00	15.34	16.73	18.15	25.95
CENTRAL AMERICA	1.39	1.47	1.55	1.64	1.72	1.81	2.26
SOUTH AMERICA	2.13	2.31	2.50	2.69	2.88	3.07	3.99
LATIN AMERICA	3.53	3.79	4.05	4.32	4.60	4.88	6.25
<b>TOTAL</b>	<b>31.10</b>	<b>33.16</b>	<b>35.24</b>	<b>37.45</b>	<b>39.87</b>	<b>42.34</b>	<b>53.82</b>

Note: Gross Commercial Imports are assumed to grow at the growth rate of aggregate GNP and Exports are assumed to remain a constant proportion of Production as based on the 1979-83 period.

no distinction is drawn between countries on the basis of the level of their per capita GNP. The developing countries covered include countries with per capita GNP levels of below \$250 as well as those with such levels of more than \$1500 and these are unevenly distributed over different regions.

Keeping these features of the results in mind, the picture of food aid requirements that emerges is one powerfully dominated by West Asia & North Africa and Sub-Saharan Africa. Within these regions, the sub-regions of North Africa and East Africa are dominant. Both Asia and Latin America have relatively small food aid requirements. Asia's food aid requirements actually fall after 1995, with falls occurring for both the sub-regions. The food aid requirements of all other regions and sub-regions increase over the entire period.

The individual country results (Table 2.4) show that as many as 26 of the 85 countries had no program food aid requirements in 1990. One country with no food aid requirements in 1990 has positive requirements in 2000 (Kampuchea) and one country with positive requirements in 1990 has zero requirements in 2000 (Guinea-Bissau), leaving the number of countries with no food aid requirements unchanged at 26 in 2000. The estimated food aid requirements are, therefore, those for 59 of the 85 countries in both years.

The country with the largest food aid requirements in 1990 is Egypt (5.89 million tons). Other countries with estimated program food aid requirements of more than one million tons each in 1990 are Bangladesh in South Asia, Republic of Korea in East Asia, Iraq in West Asia, Algeria and Morocco in North Africa, Kenya and Uganda in East Africa, and Peru in South America. In 2000, Egypt's requirement rises to almost 12 million tons and four other countries have requirements of over 4 million tons each (Iraq, Algeria, Morocco, and Kenya). Bangladesh, which has a requirement of 1.58 million tons in 1990 and 1.63 million tons in 1995, shows a fall in requirement to 1.12 million tons in 2000.

## FOOD AID AND COMMERCIAL IMPORTS

The relationship between food aid and commercial imports of cereals is of special interest. Donors of food aid are interested in increasing their commercial cereal exports. How these grow with increases in food aid under the given assumptions needs examination (Table 2.5).

In the basic method for estimating food aid requirements, commercial cereal imports are assumed to grow from their base period level at the rate of growth of per capita GNP. However, if the estimate of commercial imports obtained in this way is greater than the import gap—which is obtained by adding any exports to the difference between total domestic utilization of the major food crops and the domestic production of those crops—actual imports will to that extent be less than the estimate. Actual imports cannot exceed the import gap and a constraint to that effect is imposed on the estimate of commercial cereal imports. This constraint automatically ensures that the estimated food aid requirement for any country will never be negative at any time. The constraint does come into play for some countries, e.g. Pakistan.

For the 85 developing countries covered in the study, estimated food aid requirements of 37.42 million tons in 1990, 54.96 million tons in 1995 and 73.78 million tons in 2000 compare with gross commercial imports of 41.77 million tons, 48.92 million tons and 57.73 million tons in those years. This shows that though the gross commercial imports of these developing countries increase over the decade by almost 16 million tons, food aid increases much more rapidly—by over 36 million tons. As a result, the proportion of food aid to the total import gap increases from 47.26% in 1990 to 52.91% in 1995 and to 56.10% in 2000.

TABLE 2.3 Basic Estimate of Food Aid Needs (Method 3)

REGION	1990	1991	1992	1993	1994	1995	2000
..... in million metric tons .....							
SOUTH ASIA	2.44	2.53	2.62	2.71	2.80	2.90	2.83
EAST ASIA	2.38	2.37	2.35	2.32	2.28	2.22	1.19
ASIA	4.82	4.90	4.97	5.03	5.08	5.12	4.01
WEST ASIA	3.39	3.77	4.17	4.59	5.03	5.50	8.15
NORTH AFRICA	12.77	13.82	14.92	16.08	17.29	18.58	25.28
W. ASIA/N. AFRICA	16.16	17.59	19.09	20.67	22.33	24.08	33.44
WEST AFRICA	3.49	3.87	4.27	4.67	5.10	5.53	7.95
CENTRAL AFRICA	1.46	1.65	1.85	2.05	2.27	2.49	3.72
EAST AFRICA	7.31	8.14	8.99	9.87	10.77	11.69	16.67
SUB-SAHARAN AFRICA	12.25	13.66	15.11	16.60	18.13	19.71	28.34
CENTRAL AMERICA	1.60	1.71	1.82	1.93	2.05	2.17	2.77
SOUTH AMERICA	2.59	2.84	3.09	3.35	3.62	3.89	5.22
LATIN AMERICA	4.19	4.54	4.91	5.29	5.67	6.06	7.99
<b>TOTAL</b>	<b>37.42</b>	<b>40.70</b>	<b>44.08</b>	<b>47.58</b>	<b>51.21</b>	<b>54.96</b>	<b>73.78</b>

Note: Gross Commercial Imports are assumed to grow at the growth rate of per capita GNP and Exports are assumed to remain a constant proportion of Production as based on the 1979-83 period.

## FOOD AID NEEDS BY COUNTRY INCOME CLASS

As has been noted earlier, the per capita income levels of the developing countries covered in the study are spread over an extremely wide range. It is of considerable interest to know how the food aid needs are distributed among countries at different income levels. For this purpose, developing countries were grouped into five income classes according to their per capita GNP level in 1980:

1. Less than \$250,
2. \$250-\$499,
3. \$500-\$799,
4. \$800-\$1499,
5. \$1500 or more.

Out of the total estimated food aid requirements of 37.45 million tons in 1990, the eighteen countries in Class I accounted for 3.90 million tons, the eighteen in Class II accounted for 6.57 million tons, the ten in Class III accounted for 8.73 million tons, the twenty-two in Class IV accounted for 8.44 million tons, and the seventeen in Class V accounted for 9.81 million tons. This suggests a development-based method of paring down the estimates of food aid requirements or—what comes to the same thing—of limiting the total amount of food aid provided relative to the estimated aggregate. This would involve the fixing of an eligibility criterion for food aid recipients, with only those whose per capita income is below a certain level being considered eligible for food aid. This method also has the advantage of increasing the volume of commercial imports to the extent that food aid is reduced because it can be assumed that countries with higher per capita incomes are likely to import their full requirements commercially if they are not provided food aid.

For the purpose of this study, the eligibility criterion was set at a per capita GNP of \$800. If only countries with a per capita GNP of less than \$800 are considered eligible for food aid, 46 countries belonging to classes I, II, and III would receive food aid. The food aid requirements of these 46 countries (Table 2.6) total 19.20 million tons in 1990, 23.62 million tons in 1995 and 39.42 million tons in 2000, that is approximately half the estimated requirements for all 85 countries in those years.

The distribution of countries from different regions and sub-regions between the different income classes is extremely uneven. This is also reflected in the distribution of food aid requirements by area when food aid is subject to the eligibility criterion. The eligibility criterion affects two regions very powerfully. All the countries of West Asia/North Africa (except the two Yemens, Egypt and Sudan) and all the countries of Latin America (except Haiti, Honduras and Guyana) get excluded. The main recipients of food aid after the application of the eligibility criterion are, therefore, to be found in Sub-Saharan Africa and Asia, though some countries from these regions also get excluded under the income criterion.

Although most of the countries of West Asia/North Africa get excluded as a result of the income criterion, the countries in this region that remain eligible for food aid include Egypt and Sudan, both of which have extremely large food aid requirements. The impact of the eligibility criterion on the relative importance of West Asia/North Africa and Sub-Saharan Africa within the total of food aid requirements is, therefore, smaller than might appear to be the case. Nevertheless, the two regions interchange ranks, with the food aid requirements of Sub-Saharan Africa becoming the largest among the four regions.

**TABLE 2.4 Basic Estimates, Individual Country Results 1990-1995, 2000**

COUNTRY	1990	1991	1992	1993	1994	1995	2000
	..... in million metric tons .....						
Bangladesh	1.56	1.59	1.60	1.60	1.61	1.63	1.12
Bhutan	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Nepal	0.85	0.92	1.00	1.08	1.17	1.25	1.69
Pakistan	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sri Lanka	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SOUTH ASIA</b>	<b>2.44</b>	<b>2.53</b>	<b>2.62</b>	<b>2.71</b>	<b>2.80</b>	<b>2.90</b>	<b>2.83</b>
Burma	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fiji	0.04	0.04	0.04	0.04	0.05	0.05	0.06
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kampuchea	0.00	0.01	0.01	0.02	0.02	0.03	0.02
Korea DPR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Korea Rep	1.41	1.36	1.30	1.23	1.14	1.04	0.00
Laos	0.04	0.04	0.04	0.04	0.04	0.04	0.01
Malaysia	0.88	0.92	0.95	0.99	1.03	1.07	1.10
Philippines	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vietnam	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>EAST ASIA</b>	<b>2.38</b>	<b>2.37</b>	<b>2.35</b>	<b>2.32</b>	<b>2.28</b>	<b>2.22</b>	<b>1.19</b>
<b>ASIA</b>	<b>4.82</b>	<b>4.90</b>	<b>4.97</b>	<b>5.03</b>	<b>5.08</b>	<b>5.12</b>	<b>4.01</b>
Cyprus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iraq	2.20	2.43	2.67	2.91	3.17	3.43	4.81
Jordan	0.41	0.47	0.54	0.61	0.70	0.80	1.50
Lebanon	0.12	0.13	0.14	0.15	0.17	0.18	0.23
Syria	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Turkey	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yemen AR	0.54	0.61	0.68	0.75	0.82	0.90	1.33
Yemen PDR	0.12	0.13	0.15	0.16	0.18	0.20	0.29
<b>WEST ASIA</b>	<b>3.39</b>	<b>3.77</b>	<b>4.17</b>	<b>4.59</b>	<b>5.03</b>	<b>5.50</b>	<b>8.15</b>
Algeria	2.09	2.30	2.52	2.75	2.99	3.25	4.40
Egypt	5.89	6.34	6.82	7.33	7.88	8.46	11.88
Morocco	2.76	2.98	3.20	3.43	3.66	3.89	4.93
Sudan	1.34	1.47	1.61	1.75	1.90	2.06	2.93
Tunisia	0.69	0.73	0.77	0.82	0.87	0.92	1.14
<b>NORTH AFRICA</b>	<b>12.77</b>	<b>13.82</b>	<b>14.92</b>	<b>16.08</b>	<b>17.29</b>	<b>18.58</b>	<b>25.28</b>
<b>W. ASIA/N. AFRICA</b>	<b>16.16</b>	<b>17.59</b>	<b>19.09</b>	<b>20.67</b>	<b>22.33</b>	<b>24.08</b>	<b>33.44</b>

continued

COUNTRY	1990	1991	1992	1993	1994	1995	2000
..... in million metric tons .....							
Benin	0.20	0.23	0.26	0.30	0.33	0.37	0.58
Burkina Faso	0.23	0.26	0.30	0.34	0.37	0.42	0.67
Chad	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gambia	0.07	0.07	0.08	0.09	0.09	0.10	0.13
Ghana	0.88	0.97	1.07	1.17	1.27	1.37	1.90
Guinea	0.20	0.23	0.26	0.30	0.33	0.36	0.55
Guinea Bissau	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Ivory Coast	0.35	0.37	0.40	0.43	0.46	0.49	0.67
Liberia	0.12	0.13	0.15	0.16	0.17	0.19	0.27
Mali	0.49	0.55	0.61	0.68	0.75	0.82	1.22
Mauritania	0.15	0.16	0.17	0.18	0.19	0.20	0.26
Niger	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Senegal	0.63	0.68	0.74	0.80	0.85	0.91	1.25
Sierra Leone	0.06	0.07	0.08	0.08	0.09	0.10	0.14
Togo	0.11	0.13	0.14	0.16	0.18	0.20	0.30
<b>WEST AFRICA</b>	<b>3.49</b>	<b>3.87</b>	<b>4.27</b>	<b>4.67</b>	<b>5.10</b>	<b>5.53</b>	<b>7.95</b>
Angola	0.63	0.71	0.79	0.88	0.96	1.05	1.54
Burundi	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cameroon	0.72	0.82	0.92	1.03	1.14	1.26	1.91
Centr. Afric. Rep.	0.02	0.03	0.03	0.04	0.04	0.05	0.08
Congo	0.05	0.06	0.07	0.08	0.08	0.09	0.14
Gabon	0.03	0.03	0.03	0.04	0.04	0.04	0.06
Rwanda	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zaire	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CENTRAL AFRICA</b>	<b>1.46</b>	<b>1.65</b>	<b>1.85</b>	<b>2.05</b>	<b>2.27</b>	<b>2.49</b>	<b>3.72</b>
Botswana	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Ethiopia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kenya	2.09	2.34	2.60	2.87	3.16	3.45	5.03
Lesotho	0.22	0.24	0.26	0.28	0.31	0.33	0.46
Madagascar	0.33	0.36	0.40	0.43	0.47	0.50	0.69
Malawi	0.50	0.57	0.54	0.71	0.78	0.85	1.26
Mauritius	0.04	0.04	0.04	0.04	0.04	0.04	0.03
Mozambique	0.75	0.82	0.91	0.99	1.08	1.17	1.65
Somalia	0.30	0.31	0.31	0.31	0.31	0.32	0.35
Swaziland	0.09	0.10	0.11	0.12	0.13	0.14	0.19
Tanzania	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uganda	1.08	1.24	1.40	1.56	1.72	1.88	2.76
Zambia	0.95	1.04	1.13	1.22	1.32	1.41	1.89
Zimbabwe	0.91	1.03	1.15	1.28	1.41	1.55	2.28
<b>EAST AFRICA</b>	<b>7.31</b>	<b>8.14</b>	<b>8.99</b>	<b>9.87</b>	<b>10.77</b>	<b>11.69</b>	<b>16.67</b>
<b>SUB-SAHARAN AFRICA</b>	<b>12.25</b>	<b>13.66</b>	<b>15.11</b>	<b>16.60</b>	<b>18.13</b>	<b>19.71</b>	<b>28.34</b>

continued

TABLE 2.4 continued (3)

COUNTRY	1990	1991	1992	1993	1994	1995	2000
..... in million metric tons .....							
Costa Rica	0.10	0.10	0.11	0.11	0.12	0.12	0.14
Dominican Rep.	0.22	0.23	0.23	0.24	0.25	0.25	0.26
El Salvador	0.19	0.19	0.20	0.20	0.20	0.20	0.20
Guatemala	0.18	0.19	0.21	0.22	0.24	0.25	0.33
Haiti	0.38	0.42	0.46	0.50	0.55	0.59	0.85
Honduras	0.29	0.31	0.34	0.36	0.39	0.42	0.59
Jamaica	0.23	0.24	0.25	0.27	0.28	0.30	0.36
Nicaragua	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Panama	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Trinidad & Tobago	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CENTRAL AMERICA</b>	<b>1.60</b>	<b>1.71</b>	<b>1.82</b>	<b>1.93</b>	<b>2.05</b>	<b>2.17</b>	<b>2.77</b>
Bolivia	0.38	0.40	0.43	0.46	0.48	0.51	0.67
Colombia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ecuador	0.52	0.59	0.66	0.74	0.81	0.89	1.31
Guyana	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paraguay	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Peru	1.13	1.24	1.35	1.47	1.58	1.70	2.25
Surinam	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chile	0.56	0.61	0.65	0.70	0.74	0.79	0.99
Uruguay	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SOUTH AMERICA</b>	<b>2.59</b>	<b>2.84</b>	<b>3.09</b>	<b>3.35</b>	<b>3.62</b>	<b>3.89</b>	<b>5.22</b>
<b>LATIN AMERICA</b>	<b>4.19</b>	<b>4.54</b>	<b>4.91</b>	<b>5.29</b>	<b>5.67</b>	<b>6.06</b>	<b>7.99</b>
<b>TOTAL</b>	<b>37.42</b>	<b>40.70</b>	<b>44.08</b>	<b>47.58</b>	<b>51.21</b>	<b>54.96</b>	<b>73.78</b>

Note: Gross Commercial Imports are assumed to grow at the growth rate of per capita GNP and Exports are assumed to remain a constant proportion of Production as based on the 1979-83 period.

**TABLE 2.5 Food Aid Needs and Import Gaps (millions of metric tons)**

COUNTRY	FOOD AID NEEDS			ACTUAL GROSS COMMERCIAL IMPORTS			IMPORT GAP			FOOD AID NEEDS AS % OF IMPORT GAP		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
Bangladesh	1.58	1.63	1.12	0.46	0.53	0.61	2.04	2.15	1.72	77.63	75.59	64.83
Bhutan	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.05	43.14	44.59	43.06
Nepal	0.85	1.25	1.69	0.01	0.01	0.01	0.85	1.26	1.70	99.01	99.32	99.49
Pakistan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Sri Lanka	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	n.d.	n.d.
<b>SOUTH ASIA</b>	<b>2.44</b>	<b>2.90</b>	<b>2.83</b>	<b>0.51</b>	<b>0.56</b>	<b>0.64</b>	<b>2.95</b>	<b>3.46</b>	<b>3.47</b>	<b>82.79</b>	<b>83.85</b>	<b>81.52</b>
Burma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Fiji	0.04	0.05	0.06	0.10	0.10	0.11	0.14	0.15	0.15	28.78	31.81	33.78
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Kampuchea	0.00	0.03	0.02	0.10	0.09	0.08	0.10	0.11	0.10	1.70	23.08	21.80
Korea DPR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Korea Rep	1.41	1.04	0.00	8.15	10.60	13.58	9.57	11.65	13.58	14.77	8.95	0.00
Laos	0.04	0.04	0.01	0.06	0.06	0.07	0.11	0.10	0.08	41.24	37.54	16.68
Malaysia	0.88	1.07	1.10	2.63	3.30	4.13	3.51	4.36	5.27	25.05	24.43	20.98
Philippines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Thailand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Vietnam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
<b>EAST ASIA</b>	<b>2.38</b>	<b>2.22</b>	<b>1.19</b>	<b>11.04</b>	<b>14.16</b>	<b>17.97</b>	<b>13.42</b>	<b>16.38</b>	<b>19.11</b>	<b>17.72</b>	<b>13.56</b>	<b>6.20</b>
<b>ASIA</b>	<b>4.82</b>	<b>5.12</b>	<b>4.01</b>	<b>11.55</b>	<b>14.71</b>	<b>18.81</b>	<b>18.37</b>	<b>19.84</b>	<b>22.62</b>	<b>29.45</b>	<b>25.82</b>	<b>17.75</b>
Cyprus	0.00	0.00	0.00	0.42	0.47	0.52	0.42	0.47	0.52	0.00	0.00	0.00
Iraq	2.20	3.43	4.81	3.10	3.26	3.42	5.29	6.69	8.27	41.47	51.33	58.43
Jordan	0.41	0.80	1.50	0.80	1.11	1.52	1.22	1.90	3.07	33.85	41.85	49.57
Lebanon	0.12	0.18	0.23	0.68	0.72	0.75	0.81	0.89	0.98	15.38	19.82	23.26
Syria	0.00	0.00	0.00	0.60	0.57	0.78	0.60	0.57	0.78	0.00	0.00	0.00
Turkey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Yemen AR	0.54	0.90	1.33	0.62	0.77	0.95	1.16	1.66	2.28	46.57	53.84	58.20
Yemen PDR	0.12	0.20	0.29	0.27	0.34	0.44	0.39	0.54	0.73	30.71	36.28	39.71
<b>WEST ASIA</b>	<b>3.39</b>	<b>5.50</b>	<b>8.15</b>	<b>6.49</b>	<b>7.23</b>	<b>7.89</b>	<b>9.88</b>	<b>12.73</b>	<b>16.04</b>	<b>34.31</b>	<b>43.21</b>	<b>50.82</b>

continued

TABLE 2.5 continued (2)

COUNTRY	FOOD AID NEEDS			ACTUAL GROSS COMMERCIAL IMPORTS			IMPORT GAP			FOOD AID NEEDS AS % OF IMPORT GAP		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
Algeria	2.09	3.25	4.40	3.87	4.40	5.00	5.96	7.65	9.40	35.06	42.46	46.79
Egypt	5.89	8.46	11.88	6.85	9.35	12.75	12.75	17.81	24.63	46.23	47.52	48.25
Morocco	2.76	3.89	4.93	2.12	2.33	2.56	4.88	6.23	7.50	56.52	62.51	65.79
Sudan	1.34	2.06	2.93	0.12	0.14	0.16	1.46	2.19	3.08	91.68	93.72	94.94
Tunisia	0.69	0.92	1.14	1.06	1.25	1.47	1.75	2.17	2.61	39.36	42.45	43.83
<b>NORTH AFRICA</b>	<b>12.77</b>	<b>18.58</b>	<b>25.28</b>	<b>14.03</b>	<b>17.46</b>	<b>21.93</b>	<b>26.80</b>	<b>36.04</b>	<b>47.22</b>	<b>47.65</b>	<b>51.54</b>	<b>53.55</b>
<b>W. ASIA/N. AFRICA</b>	<b>16.18</b>	<b>24.08</b>	<b>33.44</b>	<b>20.52</b>	<b>24.89</b>	<b>29.82</b>	<b>38.88</b>	<b>48.77</b>	<b>83.26</b>	<b>44.08</b>	<b>49.37</b>	<b>52.85</b>
Benin	0.20	0.37	0.58	0.09	0.10	0.11	0.29	0.47	0.64	69.74	78.75	83.90
Burkina Faso	0.23	0.42	0.67	0.04	0.04	0.04	0.26	0.46	0.71	85.79	91.04	93.73
Chad	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Gambia	0.07	0.10	0.13	0.02	0.02	0.02	0.09	0.12	0.15	74.17	81.50	86.15
Ghana	0.88	1.37	1.90	0.12	0.09	0.07	0.99	1.47	1.98	86.04	93.56	96.21
Guinea	0.20	0.36	0.55	0.09	0.09	0.09	0.28	0.45	0.64	69.72	80.75	86.35
Guinea Bissau	0.01	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	65.35	n.d.	n.d.
Ivory Coast	0.35	0.49	0.67	0.54	0.54	0.54	0.88	1.03	1.20	39.20	47.84	55.33
Liberia	0.12	0.19	0.27	0.09	0.08	0.08	0.21	0.27	0.35	58.39	69.34	77.22
Mali	0.49	0.82	1.22	0.07	0.07	0.08	0.55	0.89	1.29	88.16	91.98	94.00
Mauritania	0.15	0.20	0.26	0.11	0.11	0.11	0.26	0.31	0.38	56.75	63.83	69.55
Niger	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Senegal	0.63	0.91	1.25	0.37	0.37	0.36	1.00	1.28	1.60	62.78	71.44	77.65
Sierra Leone	0.06	0.10	0.14	0.08	0.08	0.08	0.15	0.18	0.22	42.44	54.04	63.41
Togo	0.11	0.20	0.30	0.06	0.06	0.06	0.17	0.26	0.36	65.33	77.50	84.34
<b>WEST AFRICA</b>	<b>3.49</b>	<b>5.53</b>	<b>7.95</b>	<b>1.68</b>	<b>1.66</b>	<b>1.65</b>	<b>5.16</b>	<b>7.18</b>	<b>9.59</b>	<b>67.53</b>	<b>76.97</b>	<b>82.85</b>
Angola	0.63	1.05	1.54	0.36	0.40	0.44	1.00	1.45	1.90	63.55	72.33	77.65
Burundi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Cameroon	0.72	1.26	1.91	0.23	0.27	0.33	0.95	1.53	2.21	75.80	82.10	85.36
Central Afr. Rep	0.02	0.05	0.08	0.01	0.01	0.01	0.04	0.06	0.09	62.56	78.42	86.52
Congo	0.05	0.09	0.14	0.06	0.06	0.06	0.12	0.15	0.20	46.64	59.68	68.86

continued

COUNTRY	FOOD AID NEEDS			ACTUAL GROSS COMMERCIAL IMPORTS			IMPORT GAP			FOOD AID NEEDS AS % OF IMPORT GAP		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
Gabon	0.03	0.04	0.06	0.03	0.03	0.07	0.06	0.07	0.08	42.66	60.05	74.00
Rwanda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Zaire	0.00	0.00	0.00	0.18	0.07	0.00	0.18	0.07	0.00	0.00	0.00	n.d.
<b>CENTRAL AFRICA</b>	<b>1.46</b>	<b>2.49</b>	<b>3.72</b>	<b>0.89</b>	<b>0.85</b>	<b>0.87</b>	<b>2.35</b>	<b>3.34</b>	<b>4.57</b>	<b>62.16</b>	<b>74.46</b>	<b>81.13</b>
Botswana	0.05	0.06	0.06	0.18	0.24	0.32	0.23	0.30	0.38	20.39	19.31	16.22
Ethiopia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Kenya	2.09	3.45	5.03	0.09	0.09	0.09	2.17	3.54	5.11	95.92	97.42	98.16
Lesotho	0.22	0.33	0.46	0.17	0.21	0.25	0.39	0.54	0.77	56.01	61.27	64.88
Madagascar	0.33	0.50	0.69	0.16	0.14	0.13	0.49	0.65	0.87	66.95	77.78	84.54
Malawi	0.50	0.85	1.26	0.03	0.03	0.04	0.54	0.89	1.29	93.82	96.08	97.17
Mauritius	0.04	0.04	0.03	0.17	0.19	0.21	0.21	0.23	0.24	18.74	17.10	13.82
Mozambique	0.75	1.17	1.65	0.20	0.21	0.21	0.95	1.37	1.86	78.84	85.03	88.71
Somalia	0.30	0.32	0.35	0.08	0.08	0.08	0.39	0.40	0.43	78.53	79.48	81.34
Swaziland	0.09	0.14	0.19	0.07	0.07	0.07	0.16	0.21	0.26	57.17	67.25	73.93
Tanzania	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Uganda	1.08	1.88	2.76	0.01	0.01	0.01	1.09	1.89	2.77	99.15	99.61	99.79
Zambia	0.95	1.41	1.89	0.16	0.14	0.13	1.11	1.55	2.07	85.39	90.76	93.74
Zimbabwe	0.91	1.55	2.28	0.05	0.05	0.05	0.96	1.60	2.34	94.59	96.69	97.70
<b>EAST AFRICA</b>	<b>7.31</b>	<b>11.69</b>	<b>16.67</b>	<b>1.38</b>	<b>1.46</b>	<b>1.58</b>	<b>8.69</b>	<b>13.15</b>	<b>18.25</b>	<b>84.08</b>	<b>88.87</b>	<b>91.35</b>
<b>SUB-SAHARAN AFRICA</b>	<b>12.25</b>	<b>19.71</b>	<b>28.34</b>	<b>3.95</b>	<b>3.98</b>	<b>4.10</b>	<b>18.20</b>	<b>23.88</b>	<b>32.43</b>	<b>75.83</b>	<b>83.23</b>	<b>87.39</b>
Costa Rica	0.10	0.12	0.14	0.14	0.14	0.14	0.24	0.27	0.28	40.11	46.14	49.97
Dominican Rep.	0.22	0.25	0.26	0.25	0.23	0.21	0.48	0.48	0.48	46.71	51.98	55.17
El Salvador	0.19	0.20	0.20	0.09	0.08	0.07	0.28	0.28	0.27	68.27	72.58	75.63
Guatemala	0.18	0.25	0.33	0.18	0.19	0.19	0.36	0.44	0.57	50.29	57.73	63.10
Haiti	0.38	0.59	0.85	0.13	0.14	0.15	0.51	0.73	1.00	74.01	80.85	85.13
Honduras	0.29	0.42	0.59	0.07	0.07	0.07	0.36	0.49	0.66	80.60	85.66	89.16

continued

TABLE 2.5 continued (4)

COUNTRY	FOOD AID NEEDS			ACTUAL GROSS COMMERCIAL IMPORTS			IMPORT GAP			FOOD AID NEEDS AS % OF IMPORT GAP		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
Jamaica	0.23	0.30	0.36	0.21	0.18	0.15	0.44	0.47	0.51	51.41	62.36	70.87
Nicaragua	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	n.d.	n.d.
Panama	0.02	0.03	0.03	0.12	0.14	0.16	0.14	0.16	0.18	12.39	16.75	14.91
Trinidad & Tobago	0.00	0.00	0.00	0.38	0.44	0.50	0.38	0.44	0.50	0.00	0.00	0.00
CENTRAL AMERICA	1.60	2.17	2.77	1.61	1.60	1.64	3.20	3.77	4.41	49.88	57.45	62.78
Bolivia	0.38	0.51	0.67	0.18	0.16	0.14	0.55	0.67	0.8	68.21	76.56	82.66
Colombia	0.00	0.00	0.00	0.98	0.82	0.49	0.98	0.82	0.49	0.00	0.00	0.00
Ecuador	0.52	0.89	1.31	0.40	0.45	0.50	0.92	1.34	1.81	56.36	66.62	72.30
Guyana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Paraguay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
Peru	1.13	1.70	2.25	1.15	1.09	1.03	2.28	2.78	3.24	49.62	60.93	68.58
Surinam	0.00	0.00	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.00	n.d.	n.d.
Chile	0.56	0.79	0.99	1.33	1.37	1.40	1.90	2.16	2.34	29.63	36.54	41.41
Uruguay	0.00	0.00	0.00	0.08	0.05	0.01	0.08	0.05	0.01	0.00	0.00	0.00
SOUTH AMERICA	2.59	3.89	5.22	4.15	3.93	3.57	6.73	7.82	8.79	38.43	49.75	59.38
LATIN AMERICA	4.19	8.08	7.99	5.75	5.54	5.21	9.94	11.59	13.20	42.12	52.26	60.52
TOTAL	37.42	54.96	73.78	41.77	48.92	57.74	79.19	103.88	131.51	47.26	52.91	58.10

Note: Import Gap = Total Domestic Use - Production + Exports, thus  
the Import Gap - Actual Gross Commercial Imports = Food Aid Needs

n.d. -- not defined

TABLE 2.6 Classification of Food Aid Requirements by Country/Region and by Income Class

COUNTRY	Less than \$250			\$250-\$500			\$500-\$800			Total of Less than \$100			\$800-\$1,500			\$1,500 or More			Total All Income Groups			
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	
..... (1,000,000 Metric Tons) .....																						
BANGLADESH	1.58	1.63	1.12							1.58	1.63	1.12							1.58	1.63	1.12	
BHUTAN	0.02	0.02	0.02							0.02	0.02	0.02							0.02	0.02	0.02	
NEPAL	0.85	1.25	1.69							0.85	1.25	1.69							0.85	1.25	1.69	
PAKISTAN				0.00	0.00	0.00				0.00	0.00	0.00							0.00	0.00	0.00	
SRI LANKA	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00	
SOUTH ASIA	2.45	2.90	2.83	0.00	0.00	0.00				2.45	2.90	2.83							2.45	2.90	2.83	
BURMA	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00	
FIJI																	0.04	0.05	0.06	0.04	0.05	0.06
INDONESIA				0.00	0.00	0.00				0.00	0.00	0.00							0.00	0.00	0.00	
KAMPUCHEA	0.00	0.03	0.02							0.00	0.03	0.02							0.00	0.03	0.02	
KOREA DPR													0.00	0.00	0.00				0.00	0.00	0.00	
KOREA REP																1.41	1.04	0.00	1.41	1.04	0.00	
LAOS	0.04	0.04	0.01							0.04	0.04	0.01							0.04	0.04	0.01	
MALAYSIA																0.88	1.07	1.10	0.88	1.07	1.10	
PHILIPPINES							0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00	0.00	
THAILAND							0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00	0.00	
VIETNAM	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00	
EAST ASIA	0.04	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.03	0.00	0.00	0.00	2.33	2.16	1.16	2.37	2.23	1.19	
ASIA	2.49	2.97	2.86	0.00	0.00	0.00	0.00	0.00	0.00	2.49	2.97	2.86	0.00	0.00	0.00	2.33	2.16	1.16	4.82	5.13	4.02	
CYPRUS																			0.00	0.00	0.00	
IRAQ																2.20	3.43	4.81	2.20	3.43	4.81	
JORDAN													0.41	0.80	1.50				0.41	0.80	1.50	
LEBANON													0.12	0.16	0.23				0.12	0.16	0.23	
SYRIA													0.00	0.00	0.00				0.00	0.00	0.00	
TURKEY																0.00	0.00	0.00	0.00	0.00	0.00	
YEMEN AR							0.54	0.90	1.33	0.54	0.90	1.33							0.54	0.90	1.33	
YEMEN PR				0.12	0.20	0.29				0.12	0.20	0.29							0.12	0.20	0.29	
WEST ASIA				0.12	0.20	0.29	0.54	0.90	1.33	0.66	1.10	1.62	0.53	0.98	1.73	2.20	3.43	4.81	3.39	5.51	8.16	

continued

TABLE 2.6 continued (2)

COUNTRY	Less than \$250			\$250-\$500			\$500-\$800			Total of Less than \$800			\$800-\$1,500			\$1,500 or More			Total All Income Groups		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
..... (1,000,000 Metric Tons) .....																					
ALGERIA																2.09	3.25	4.40	2.09	3.25	4.40
EGYPT							5.89	8.46	11.88	5.89	8.46	11.88							5.89	8.46	11.88
MOROCCO													2.76	3.89	4.93				2.76	3.89	4.93
SUDAN				1.34	2.06	2.93				1.34	2.06	2.93							1.34	2.06	2.93
TUNISIA													0.69	0.92	1.14				0.69	0.92	1.14
NORTH AFRICA				1.34	2.06	2.93	5.89	8.46	11.88	7.23	10.52	14.81	3.45	4.81	6.07	2.09	3.25	4.40	12.77	18.58	25.28
W.ASIA/N.AFRICA				1.46	2.26	3.22	8.43	9.36	13.21	7.89	11.62	16.43	3.98	5.79	7.80	4.29	6.88	9.21	16.16	24.09	33.44
BENIN				0.20	0.37	0.58				0.20	0.37	0.58							0.20	0.37	0.58
BURKINA FAS	0.23	0.42	0.67							0.23	0.42	0.67							0.23	0.42	0.67
CHAD	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00
GAMBIA				0.07	0.10	0.13				0.07	0.10	0.13							0.07	0.10	0.13
GHANA																0.88	1.37	1.90	0.88	1.37	1.90
GUINEA				0.20	0.36	0.55				0.20	0.36	0.55							0.20	0.36	0.55
GUINEA-BISS	0.01	0.00	0.00							0.01	0.00	0.00							0.01	0.00	0.00
IVORY COAST													0.35	0.49	0.67				0.35	0.49	0.67
LIBERIA							0.12	0.19	0.27	0.12	0.19	0.27							0.12	0.19	0.27
MALI	0.49	0.83	1.22							0.49	0.83	1.22							0.49	0.83	1.22
MAURITANIA				0.15	0.20	0.26				0.15	0.20	0.26							0.15	0.20	0.26
NIGER				0.00	0.00	0.00				0.00	0.00	0.00							0.00	0.00	0.00
SENEGAL				0.63	0.91	1.25				0.63	0.91	1.25							0.63	0.91	1.25
SIERRA LEONE				0.06	0.10	0.14				0.06	0.10	0.14							0.06	0.10	0.14
TOGO				0.11	0.20	0.30				0.11	0.20	0.30							0.11	0.20	0.30
WEST AFRICA	0.73	1.25	1.89	1.42	2.24	3.21	0.12	0.19	0.27	2.27	3.68	5.37	0.35	0.49	0.67	0.88	1.37	1.90	3.50	5.54	7.94

continued

COUNTRY	Less than \$250			\$250-\$500			\$500-\$800			Total of Less than \$800			\$800-\$1,500			\$1,500 or More			Total All Income Groups		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
	(1,000,000 Metric Tons)																				
ANGOLA													0.63	1.05	1.54				0.63	1.05	1.54
BURUNDI	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00
CAMEROON							0.72	1.26	1.91	0.72	1.26	1.91							0.72	1.26	1.91
CENT AFR REP				0.02	0.05	0.08				0.02	0.05	0.08							0.02	0.05	0.08
CONGO													0.05	0.09	0.14				0.05	0.09	0.14
GABON																0.03	0.04	0.05	0.03	0.04	0.05
RWANDA	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00
ZAIRE	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00
CENTRAL AFR	0.00	0.00	0.00	0.02	0.05	0.08	0.72	1.26	1.91	0.74	1.31	1.99	0.68	1.14	1.68	0.03	0.04	0.05	1.45	2.49	3.73
BOTSWANA													0.06	0.06	0.06				0.06	0.06	0.06
ETHIOPIA	0.00	0.00	0.00							0.00	0.00	0.00							0.00	0.00	0.00
KENYA				2.09	3.45	5.03				2.09	3.45	5.03							2.09	3.45	5.03
LESOTHO							0.22	0.33	0.46	0.22	0.33	0.46							0.22	0.33	0.46
MADAGASCAR				0.33	0.50	0.69				0.33	0.50	0.69							0.33	0.50	0.69
MALAWI				0.50	0.85	1.26				0.50	0.85	1.26							0.50	0.85	1.26
MAURITIUS													0.04	0.04	0.03				0.04	0.04	0.03
MOZAMBIQUE				0.75	1.17	1.65				0.75	1.17	1.65							0.75	1.17	1.65
SOMALIA	0.30	0.32	0.35							0.30	0.32	0.35							0.30	0.32	0.35
SWAZILAND													0.09	0.14	0.19				0.09	0.14	0.19
TANZANIA				0.00	0.00	0.00				0.00	0.00	0.00							0.00	0.00	0.00
UGANDA																1.08	1.88	2.76	1.08	1.88	2.76
ZAMBIA							0.95	1.41	1.89	0.95	1.41	1.89							0.95	1.41	1.89
ZIMBABWE													0.91	1.55	2.28				0.91	1.55	2.28
EAST AFRICA	0.30	0.32	0.35	3.67	5.97	8.63	1.17	1.74	2.35	5.14	8.03	11.33	1.10	1.79	2.56	1.08	1.88	2.76	7.32	11.70	16.65
S.S. AFRICA	1.03	1.57	2.24	5.11	8.28	11.92	2.01	3.19	4.53	8.15	13.02	18.89	2.13	3.42	4.91	1.98	3.29	4.72	12.27	19.73	28.32

continued

TABLE 2.6 continued (3)

COUNTRY	Less than \$250			\$250-\$500			\$500-\$800			Total of Less than \$800			\$800-\$1,500			\$1,500 or More			Total All Income Groups		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
..... (1,000,000 Metric Tons) .....																					
COSTA RICA															0.1	0.12	0.14	0.10	0.12	0.14	
DOMINICAN REP													0.22	0.25	0.26				0.22	0.25	0.26
EL SALVADOR													0.19	0.20	0.20				0.19	0.20	0.20
GUATEMALA													0.18	0.25	0.33				0.18	0.25	0.33
HAITI	0.38	0.59	0.85							0.38	0.59	0.85							0.38	0.59	0.85
HONDURAS							0.29	0.42	0.59	0.29	0.42	0.59							0.29	0.42	0.59
JAMAICA													0.23	0.30	0.36				0.23	0.30	0.36
NICARAGUA													0.00	0.00	0.00				0.00	0.00	0.00
PANAMA																0.02	0.03	0.03	0.02	0.03	0.03
TRINID & TOB																0.00	0.00	0.00	0.00	0.00	0.00
CENTRAL AME	0.38	0.59	0.85				0.29	0.42	0.59	0.67	1.01	1.44	0.82	1.00	1.15	0.12	0.15	0.17	1.61	2.16	2.76
BOLIVIA													0.38	0.51	0.67				0.38	0.51	0.67
COLOMBIA													0.00	0.00	0.00				0.00	0.00	0.00
EQUADOR																0.52	0.89	1.31	0.52	0.89	1.31
GUYANA							0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00	0.00
PARAGUAY													0.00	0.00	0.00				0.00	0.00	0.00
PERU													1.13	1.70	2.25				1.13	1.70	2.25
SURINAM																0.00	0.00	0.00	0.00	0.00	0.00
CHILE																0.56	0.79	0.99	0.56	0.79	0.99
URUGUAY																0.00	0.00	0.00	0.00	0.00	0.00
SOUTH AMERICA							0.00	0.00	0.00	0.00	0.00	0.00	1.51	2.21	2.92	1.08	1.68	2.30	2.59	3.89	5.22
LATIN AMERI	0.38	0.59	0.85				0.29	0.42	0.59	0.67	1.01	1.44	2.33	3.21	4.07	1.20	1.83	2.47	4.20	6.05	7.98
TOTAL	3.80	5.13	5.95	6.57	10.52	15.14	8.73	12.97	18.33	19.20	28.82	39.42	8.44	12.42	16.78	9.81	13.98	17.56	37.45	55.00	73.76
Number	18	18	18	18	18	18	10	10	10	46	46	46	22	22	22	17	17	17	85	85	85

Note: 1980 trend value of per capita GNP is used, based on 1961-80 period.

In Asia, the food aid requirements of eligible countries are almost halved but rise proportionately to the full regional total over time. However, the entire fall occurs in East Asia, where the countries remaining eligible have extremely small requirements. All the countries in South Asia remain eligible. The food aid requirements of Latin America fall dramatically with the application of the eligibility criterion and also fall proportionally to the full regional requirement over time.

## FOOD AID FOR LOW INCOME COUNTRIES AND COMMERCIAL IMPORTS

The full implications of imposing the income constraint on food aid recipients can only be understood by examining the relationship of estimated food aid requirements to commercial cereal imports and the food import gap. While the estimated food aid requirements of low income countries rise rapidly from 19.19 million tons in 1990 to 39.43 million tons in 2000, the gross commercial imports of the same countries rise much more slowly from 11.08 million tons in 1990 to 17.60 million tons in 2000 (Table 2.7). These movements are reflected in a rise in the proportion of food aid received by the low income countries to their food import gaps from 63.40% in 1990 to 69.14% in 2000.

There are of course wide differences in these proportions between different regions and sub-regions. Amongst the regions, the proportion in 1990 varies from a high of 78.90% in Asia to a low of 50.09% in West Asia/North Africa. Amongst sub-regions, the variation is from a high of 85.04% in East Africa to a low of 22.46% in East Asia.

In the aggregate, these proportions are very high. However, the comparison should correctly be made not with the commercial imports of only the low income countries but with those of all developing countries. Before such a comparison is made, it should be recognized that the estimated commercial imports of the high income countries cannot remain unchanged with the imposition of the income criterion for the provision of food aid. To deny food aid to these countries on the ground that their income is high enough is to assert that this income is sufficient for them to be able to import all their food requirements commercially. This means that the commercial food imports of these countries must increase by the amount of their estimated food aid requirements when such food aid is not provided to them because they do not satisfy the eligibility criterion. In any case, it is only when the estimated food aid requirements of these countries are added back to their estimated commercial imports that the sum of their food aid requirements and gross commercial imports will add up to their total food import gap.

The estimated food aid requirements of low income developing countries of 19.19 million tons in 1990, 28.58 million tons in 1995 and 39.43 million tons in 2000 can then be compared with total gross commercial imports of all developing countries of 60.00 million tons in 1990, 75.30 million tons in 1995 and 92.09 million tons in 2000 (Table 2.8). The estimates of food aid requirements for the medium term future can now be seen in perspective. While total food aid requirements of the low income countries increase by 20.24 million tons between 1990 and 2000, commercial food imports of all developing countries increase by 32.09 million tons. As a result, the proportion that food aid to low income developing countries forms to the food import gaps of all developing countries now rises much more slowly from the much lower level of 24.24% in 1990 to 27.52% in 1995 and 29.98% in 2000. These proportions are substantially lower than those obtained when the food aid needs of the low income countries are compared with their own food import gaps.

**TABLE 2.7 Food Aid Needs of Low Income Countries by Region and Import Gap (millions of metric tons)**

REGION	FOOD AID NEEDS			ACTUAL GROSS COMMERCIAL IMPORTS			IMPORT GAP			FOOD AID NEEDS AS % OF IMPORT GAP		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
SOUTH ASIA	2.44	2.90	2.83	0.51	0.56	0.64	2.95	3.46	3.47	82.79	83.85	81.52
EAST ASIA	0.05	0.07	0.04	0.16	0.15	0.15	0.20	0.22	0.18	22.46	29.93	13.59
ASIA	2.49	2.97	2.86	0.67	0.71	0.79	3.16	3.68	3.65	78.90	80.66	78.41
WEST ASIA	0.66	1.09	1.61	0.89	1.11	1.39	1.55	2.20	3.00	42.59	49.54	53.73
NORTH AFRICA	7.23	10.52	14.81	6.98	9.48	12.90	14.21	20.00	27.71	50.91	52.59	53.44
W. ASIA/N. AFRICA	7.89	11.61	16.42	7.86	10.59	14.29	15.76	22.20	30.71	50.09	52.29	53.47
WEST AFRICA	2.27	3.66	5.38	1.02	1.02	1.03	3.29	4.69	6.41	68.95	78.19	83.89
CENTRAL AFRICA	0.74	1.30	1.98	0.43	0.36	0.34	1.17	1.67	2.32	63.55	78.28	85.41
EAST AFRICA	5.14	8.03	11.34	0.90	0.91	0.93	6.04	8.94	12.27	85.04	89.83	92.45
SUB-SAHARAN AFRICA	8.15	12.99	18.70	2.35	2.29	2.30	10.50	15.29	21.00	77.61	85.00	89.06
CENTRAL AMERICA	0.66	1.01	1.44	0.20	0.21	0.22	0.86	1.22	1.66	76.72	82.78	86.73
SOUTH AMERICA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
LATIN AMERICA	0.66	1.01	1.44	0.20	0.21	0.22	0.86	1.22	1.66	76.72	82.78	86.73
TOTAL	19.19	28.58	39.43	11.08	13.81	17.60	30.27	42.39	57.03	63.40	87.42	89.14

Note: Import Gap = Total Domestic Use - Production + Exports, thus  
the Import Gap - Actual Gross Commercial Imports = Food Aid Needs

n.d. -- not defined

## Variability of Food Aid Requirements

### VARIABILITY IN INDIVIDUAL COUNTRIES

The estimates of food aid requirements presented in Chapter II are derived from trends in the underlying variables and are, therefore, trend-based in nature. It follows that actual food aid requirements may differ from the trend-based estimates even if all the assumptions made are fully satisfied. This is because of year to year variations around trend in variables like food production. In this study, it is assumed that the correct policy would be for food aid to vary (a) only with variations in food production, and (b) to the full extent of such variations. This assumption has been made after considering other sources of possible variation in domestic supply as well as other means of handling the effects of production.

To estimate the variability of food aid requirements on these assumptions, it is necessary first to estimate the past variability of food production around trend for each country. This past variability is measured as the coefficient of variation, which is the percentage of the standard deviation to the geometric mean of past trend values. This is then applied to the projected trend values of food production estimated for future years on the assumption that variability in production in future years will be proportionally the same as in the past. The quantities of variation thus obtained are added to and deducted from trend food production to give the upper and lower limits of expected production around the trend. Corresponding quantities of food exports are estimated by applying the proportion of such exports to production in the base period to these new upper and lower values of possible production in each year.

Upper and lower limits for food aid requirements around the basic estimates are then obtained by deducting estimated commercial cereal imports and the lower and upper estimates of production from the estimated consumption and then adding back the lower and higher estimates of cereal exports. Given our assumptions, the lower limit of food aid requirements for any country, like the trend estimate itself, can never be negative. Any negative result obtained from the computation is treated as nil. It follows from this that the absolute difference of the lower limit for any country from the trend level cannot exceed the trend estimate itself so that the percentage lower difference can never be more than one hundred percent. This contrasts with the position regarding upward variations in food aid needs, where no artificial constraint is imposed. As a result, the upper limit can reach any level, the absolute upper difference can be much larger than the trend estimate itself and the percentage upper difference can be substantially above a hundred percent.

The results showing the variability of food aid requirements on this basis are presented in Table 3.1. This shows the likely upper and lower limits of food aid requirements for each country relative to the trend food aid requirements. It also shows the absolute amount of variation from trend in both positive and negative directions. These are described as absolute positive and negative differences. The proportion formed by these differences to the trend values are also presented in the table. This clearly depends on the coefficient of variation of production, the trend value of production and the trend value of the food aid requirements. The first two determine the absolute differences and these in relation to the size of the trend requirement determines the percentage difference.

TABLE 2.8 Comparison of Food Aid Needs of Low Income Countries with the Import Gap of All Countries

REGION	FOOD AID NEEDS LOW INCOME COUNTRIES			ACTUAL GROSS COMMERCIAL IMPORTS ALL COUNTRIES WHEN FOOD AID RESTRICTED TO LOW INCOME COUNTRIES a/			IMPORT GAP ALL COUNTRIES			FOOD AID NEEDS OF LOW INCOME COUNTRIES AS PERCENTAGE OF IMPORT GAP OF ALL COUNTRIES		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
SOUTH ASIA	2.44	2.90	2.83	0.51	0.56	0.64	2.95	3.46	3.47	82.79	83.85	81.52
EAST ASIA	0.05	0.07	0.04	13.37	16.31	19.12	13.42	16.38	19.15	0.34	0.40	0.19
ASIA	2.49	2.97	2.86	13.88	16.87	19.76	16.37	19.84	22.62	15.21	14.95	12.66
WEST ASIA	0.66	1.09	1.61	9.22	11.64	14.43	9.88	12.73	16.04	6.66	8.57	10.06
NORTH AFRICA	7.23	10.52	14.81	19.57	25.52	32.41	26.80	36.04	47.22	26.99	29.19	31.36
W. ASIA/N. AFRICA	7.89	11.61	16.42	28.79	37.16	46.84	36.68	48.77	63.26	21.51	23.81	25.96
WEST AFRICA	2.27	3.66	5.38	2.91	3.52	4.22	5.16	7.18	9.59	43.87	51.00	56.04
CENTRAL AFRICA	0.74	1.30	1.98	1.60	2.04	2.61	2.35	3.34	4.59	31.66	39.02	43.21
EAST AFRICA	5.14	8.03	11.34	3.55	5.13	6.91	8.69	13.15	18.25	59.13	61.01	62.14
SUB-SAHARAN AFRICA	8.15	12.99	18.70	8.06	10.69	13.74	16.20	23.68	32.43	50.29	54.87	57.66
CENTRAL AMERICA	0.66	1.01	1.44	2.54	2.76	2.97	3.20	3.77	4.41	20.70	26.87	32.72
SOUTH AMERICA	0.00	0.00	0.00	6.73	7.82	8.79	6.73	7.82	8.79	0.00	0.00	0.00
LATIN AMERICA	0.66	1.01	1.44	9.27	10.58	11.76	9.94	11.59	13.20	6.67	8.74	10.93
TOTAL	19.18	28.58	39.43	80.00	75.30	92.09	79.19	103.88	131.51	24.24	27.52	29.98

a/ Actual Gross Commercial Imports of all countries plus Food Aid Needs of high income countries.

## VARIABILITY IN COUNTRY GROUPS

The variation in the aggregate food aid needs of each group of countries (including the group of all countries) is of course *not* equal to the sum of the variations in the food aid needs of the countries in that group since the variations in production in different countries need not coincide in direction and magnitude. For each such group of countries, therefore, the likely variation in food aid needs has to be directly estimated from the variability in the aggregate production (and exports) of that group of countries. A serious problem arises in doing this because of the treatment that is accorded to any negative estimates of individual country food aid needs and that must also be accorded to any negative upper or lower estimates of food aid needs. Such estimates, wherever they occur, are treated as nil on the ground that negative food aid needs of one country cannot offset the positive food aid needs of another. However, if such countries are included in any group whose aggregate production is examined for variations as a basis for estimating variations in food aid needs, their negative food aid requirements do in fact enter into the ultimate measure of the food aid needs of that group. There is no way in which these can then be disentangled to obtain a more acceptable estimate of the variations in the food aid needs of that group of countries. On the other hand, it is not possible to simply exclude countries that show some possible negative food aid needs from the relevant group. It is possible that they may have some positive food aid needs in some years that ought not to be excluded.

The search for a solution to this problem, that would make it possible to obtain reasonable upper and lower estimates of food aid needs for various groups of countries (including the group of all countries), is assisted by classifying countries according to the positive or negative character of all three estimates of their individual food aid needs—the upper limit, the trend or average, and the lower limit.

Table 3.2 shows how such a classification would work. Countries for which all three estimates of food aid needs are positive would form one class—A. Those for which the upper and trend estimates are positive but the lower are negative would form a second class—B. Those for which only the upper estimate is positive, while both trend and lower estimates are negative would form a third class—C. Countries for which all three estimates are negative would then fall into the fourth class—D.

An examination of the nature of these classes suggests that the best estimate of both upper and lower limits for any group consisting of all classes of countries (including the group of all countries) is the highest estimate for that group obtained by taking class A alone or either of the combinations—classes A and B or classes A, B and C—discussed above. Most of these results come from the combination of classes A and B, but there are some that are obtained by taking class A countries only and others that are obtained by taking classes A, B and C. These selected results are considered to be the best estimates of the results for any group and at the same time possibly to be underestimates of some degree because of the influence of negative values that would remain for the estimates of some countries.

The variability of food aid requirements for the world and for regional and sub-regional groups of countries when no income constraint is imposed on recipients of food aid is presented in Table 3.3. This shows that food aid requirement for all developing countries varies in 1990 between 42.29 million tons and 33.57 million tons around the trend estimate of 37.42.

The positive percentage difference is 13% and the negative percentage difference is 10.3%. The region with the highest positive percentage difference (27.24%) is Asia and

**TABLE 3.1 Variability of Food Aid Needs for Individual Countries: Trend, Upper and Lower Estimates**

	Row 1: Upper Estimate, based on (Prod - 1 S.D.)							Difference from Basic Estimates (row 2)							Percentage Difference from Basic Estimates						
	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....						
<b>Bangladesh</b>	2.46	2.49	2.53	2.57	2.61	2.65	2.31	0.88	0.91	0.93	0.96	0.99	1.02	1.19	55.54	57.05	58.55	60.04	61.51	62.95	106.88
	1.58	1.59	1.60	1.60	1.61	1.63	1.12	0.88	0.91	0.93	0.96	0.99	1.02	1.12	55.54	57.05	58.55	60.04	61.51	62.95	100.00
	0.70	0.68	0.66	0.64	0.62	0.60	0.00	0.88	0.91	0.93	0.96	0.99	1.02	1.12	55.54	57.05	58.55	60.04	61.51	62.95	100.00
<b>Bhutan</b>	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.87	6.88	6.89	6.90	6.91	6.92	7.88
	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.87	6.88	6.89	6.90	6.91	6.92	7.88
	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.87	6.88	6.89	6.90	6.91	6.92	7.88
<b>Nepal</b>	1.16	1.24	1.32	1.40	1.49	1.58	2.02	0.31	0.31	0.32	0.32	0.32	0.33	36.86	34.02	31.54	29.37	27.45	25.73	19.79	
	0.85	0.92	1.00	1.08	1.17	1.25	1.69	0.31	0.31	0.32	0.32	0.32	0.33	36.86	34.02	31.54	29.37	27.45	25.73	19.79	
	0.53	0.61	0.69	0.77	0.85	0.93	1.36	0.31	0.31	0.32	0.32	0.32	0.33	36.86	34.02	31.54	29.37	27.45	25.73	19.79	
<b>Pakistan</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
<b>Sri Lanka</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
<b>Burma</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
<b>Fiji</b>	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	9.14	8.83	8.54	8.26	8.00	7.75	6.95	
	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	9.14	8.83	8.54	8.26	8.00	7.75	6.95	
	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	9.14	8.83	8.54	8.26	8.00	7.75	6.95	
<b>Indonesia</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	

continued

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....						
Kampuchea	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.39	0.39	0.40	0.40	0.40	0.41	0.43	23681.72	6486.47	3693.11	2551.91	1933.28	1546.11	1886.60
	0.00	0.01	0.01	0.02	0.02	0.03	0.02														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.02	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Korea DPR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Korea Rep	2.35	2.30	2.25	2.17	2.09	1.99	0.74	0.94	0.94	0.94	0.94	0.94	0.94	0.74	66.39	68.82	72.10	76.49	82.42	90.61	n.d.
	1.41	1.36	1.30	1.23	1.14	1.04	0.00														
	0.47	0.43	0.36	0.29	0.20	0.10	0.00	0.94	0.94	0.94	0.94	0.94	0.94	0.00	66.39	68.82	72.10	76.49	82.42	90.61	n.d.
Laos	0.18	0.18	0.19	0.19	0.19	0.19	0.19	0.14	0.14	0.14	0.15	0.15	0.16	0.18	307.25	322.07	338.56	357.00	377.74	401.24	1347.01
	0.04	0.04	0.04	0.04	0.04	0.04	0.01														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.01	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Malaysia	1.03	1.06	1.10	1.14	1.17	1.21	1.24	0.15	0.15	0.15	0.15	0.14	0.14	0.14	16.72	15.98	15.29	14.65	14.05	13.49	12.82
	0.88	0.92	0.96	0.99	1.03	1.07	1.10														
	0.73	0.77	0.81	0.85	0.88	0.92	0.96	0.15	0.15	0.15	0.15	0.14	0.14	0.14	16.72	15.98	15.29	14.65	14.05	13.49	12.82
Philippine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Thailand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Vietnam	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Cyprus	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

continued

TABLE 3.1 continued (\$)

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	(1,000,000 Metric Tons)							(1,000,000 Metric Tons)							(1,000,000 Metric Tons)						
Iraq	2.72	2.94	3.17	3.41	3.66	3.92	5.25	0.52	0.52	0.51	0.50	0.49	0.48	0.44	23.89	21.24	19.01	17.10	15.45	14.01	9.18
	2.20	2.43	2.67	2.91	3.17	3.43	4.81														
	1.67	1.91	2.16	2.42	2.68	2.95	4.37	0.52	0.52	0.51	0.50	0.49	0.48	0.44	23.89	21.24	19.01	17.10	15.45	14.01	9.18
Jordan	0.47	0.53	0.59	0.67	0.75	0.85	1.54	0.06	0.06	0.06	0.05	0.05	0.05	0.04	14.58	12.34	10.44	8.83	7.47	6.33	2.83
	0.41	0.47	0.54	0.61	0.70	0.80	1.50														
	0.35	0.41	0.48	0.56	0.65	0.75	1.46	0.06	0.06	0.06	0.05	0.05	0.05	0.04	14.58	12.34	10.44	8.83	7.47	6.33	2.83
Lebanon	0.13	0.14	0.15	0.16	0.17	0.18	0.23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.25	3.71	3.24	2.84	2.50	2.20	1.26
	0.12	0.13	0.14	0.15	0.17	0.18	0.23														
	0.12	0.13	0.14	0.15	0.16	0.17	0.23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	4.25	3.71	3.24	2.84	2.50	2.20	1.26
Syria	1.19	1.22	1.26	1.29	1.33	1.38	1.38	1.19	1.22	1.26	1.29	1.33	1.38	1.38	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Turkey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Yemen AR	0.65	0.72	0.78	0.85	0.92	0.99	1.41	0.11	0.11	0.11	0.10	0.10	0.10	0.09	21.12	18.26	15.93	14.00	12.39	11.02	6.44
	0.54	0.61	0.68	0.75	0.82	0.90	1.33														
	0.43	0.50	0.57	0.64	0.72	0.80	1.24	0.11	0.11	0.11	0.10	0.10	0.10	0.09	21.12	18.26	15.93	14.00	12.39	11.02	6.44
Yemen PDR	0.13	0.14	0.16	0.17	0.19	0.20	0.30	0.01	0.01	0.01	0.01	0.01	0.01	0.01	6.71	6.07	5.52	5.03	4.61	4.23	2.96
	0.12	0.13	0.15	0.16	0.18	0.20	0.29														
	0.11	0.12	0.14	0.15	0.17	0.19	0.28	0.01	0.01	0.01	0.01	0.01	0.01	0.01	6.71	6.07	5.52	5.03	4.61	4.23	2.96
Algeria	2.51	2.72	2.93	3.15	3.39	3.63	4.75	0.42	0.41	0.41	0.40	0.39	0.39	0.35	20.19	18.00	16.14	14.52	13.12	11.89	8.02
	2.09	2.30	2.52	2.75	2.99	3.25	4.40														
	1.67	1.89	2.12	2.35	2.60	2.86	4.05	0.42	0.41	0.41	0.40	0.39	0.39	0.35	20.19	18.00	16.14	14.52	13.12	11.89	8.02
Egypt	6.15	6.60	7.06	7.60	8.15	8.74	12.18	0.26	0.26	0.27	0.27	0.27	0.28	0.29	4.45	4.18	3.93	3.70	3.48	3.28	2.47
	5.89	6.34	6.82	7.33	7.88	8.46	11.88														
	5.63	6.07	6.55	7.06	7.60	8.19	11.59	0.26	0.26	0.27	0.27	0.27	0.28	0.29	4.45	4.18	3.93	3.70	3.48	3.28	2.47

continued

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	(1,000,000 Metric Tons)							(1,000,000 Metric Tons)							(1,000,000 Metric Tons)						
Morocco	3.64	3.84	4.04	4.25	4.46	4.68	5.64	0.88	0.86	0.84	0.82	0.80	0.79	0.71	31.70	28.75	26.18	23.94	21.97	20.22	14.35
	2.76	2.98	3.20	3.43	3.66	3.89	4.93														
	1.89	2.12	2.36	2.61	2.85	3.10	4.22	0.88	0.86	0.84	0.82	0.80	0.79	0.71	31.70	28.75	26.18	23.94	21.97	20.22	14.35
Sudan	2.22	2.37	2.52	2.68	2.85	3.02	3.98	0.88	0.90	0.92	0.93	0.95	0.97	1.06	65.81	61.12	56.97	53.28	49.97	46.99	36.13
	1.34	1.47	1.61	1.75	1.90	2.06	2.93														
	0.46	0.57	0.69	0.82	0.95	1.09	1.87	0.88	0.90	0.92	0.93	0.95	0.97	1.06	65.81	61.12	56.97	53.28	49.97	46.99	36.13
Tunisia	0.88	0.92	0.96	1.01	1.06	1.11	1.33	0.19	0.19	0.19	0.19	0.19	0.19	0.19	27.27	25.71	24.26	22.89	21.61	20.41	16.41
	0.69	0.73	0.77	0.82	0.87	0.92	1.14														
	0.50	0.54	0.59	0.63	0.68	0.73	0.96	0.19	0.19	0.19	0.19	0.19	0.19	0.19	27.27	25.71	24.26	22.89	21.61	20.41	16.41
Benin	0.29	0.33	0.36	0.39	0.43	0.47	0.69	0.09	0.09	0.09	0.10	0.10	0.10	0.11	45.21	40.10	35.93	32.47	29.55	27.06	18.51
	0.20	0.23	0.26	0.30	0.33	0.37	0.58														
	0.11	0.14	0.17	0.20	0.23	0.27	0.47	0.09	0.09	0.09	0.10	0.10	0.10	0.11	45.21	40.10	35.93	32.47	29.55	27.06	18.51
Burkina Fa	0.39	0.43	0.47	0.51	0.56	0.60	0.87	0.17	0.17	0.17	0.18	0.18	0.18	0.20	73.83	65.31	58.45	52.82	48.10	44.10	30.10
	0.23	0.26	0.30	0.34	0.37	0.42	0.67														
	0.06	0.09	0.12	0.16	0.19	0.23	0.47	0.17	0.17	0.17	0.18	0.18	0.18	0.20	73.83	65.31	58.45	52.82	48.10	44.10	30.10
Chad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Gambia	0.10	0.11	0.11	0.12	0.12	0.13	0.16	0.03	0.03	0.03	0.03	0.03	0.03	0.03	47.92	43.08	38.97	35.43	32.36	29.67	19.96
	0.07	0.07	0.08	0.09	0.09	0.10	0.13														
	0.04	0.04	0.05	0.06	0.06	0.07	0.10	0.03	0.03	0.03	0.03	0.03	0.03	0.03	47.92	43.08	38.97	35.43	32.36	29.67	19.96
Ghana	0.99	1.09	1.18	1.28	1.38	1.47	1.99	0.12	0.11	0.11	0.11	0.10	0.10	0.09	13.20	11.57	10.24	9.13	8.20	7.40	4.69
	0.88	0.97	1.07	1.17	1.27	1.37	1.90														
	0.76	0.86	0.96	1.06	1.17	1.27	1.82	0.12	0.11	0.11	0.11	0.10	0.10	0.09	13.20	11.57	10.24	9.13	8.20	7.40	4.69
Guinea	0.25	0.28	0.31	0.35	0.38	0.41	0.60	0.05	0.05	0.05	0.05	0.05	0.05	0.05	25.37	21.83	19.09	16.91	15.13	13.65	8.87
	0.20	0.23	0.26	0.30	0.33	0.36	0.55														
	0.15	0.18	0.21	0.25	0.28	0.31	0.51	0.05	0.05	0.05	0.05	0.05	0.05	0.05	25.37	21.83	19.09	16.91	15.13	13.65	8.87

continued

TABLE 3.1 continued (5)

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	(1,000,000 Metric Tons)							(1,000,000 Metric Tons)							(1,000,000 Metric Tons)						
Guinea Bis	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.03	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ivory Coast	0.46	0.50	0.53	0.56	0.60	0.63	0.83	0.12	0.12	0.13	0.13	0.13	0.14	0.16	33.96	32.49	31.18	30.02	28.97	28.03	24.38
	0.35	0.37	0.40	0.43	0.46	0.49	0.67														
	0.23	0.25	0.28	0.30	0.33	0.36	0.50	0.12	0.12	0.13	0.13	0.13	0.14	0.16	33.96	32.49	31.18	30.02	28.97	28.03	24.38
Liberia	0.13	0.14	0.16	0.17	0.18	0.20	0.28	0.01	0.01	0.01	0.01	0.01	0.01	0.01	9.26	8.54	7.92	7.38	6.91	6.49	4.89
	0.12	0.13	0.15	0.16	0.17	0.19	0.27														
	0.11	0.12	0.13	0.15	0.16	0.18	0.26	0.01	0.01	0.01	0.01	0.01	0.01	0.01	9.26	8.54	7.92	7.38	6.91	6.49	4.89
Mali	0.71	0.77	0.83	0.90	0.97	1.04	1.43	0.22	0.22	0.22	0.22	0.22	0.22	0.22	44.56	39.53	35.38	31.91	28.97	26.44	17.72
	0.49	0.55	0.61	0.68	0.75	0.82	1.22														
	0.27	0.33	0.40	0.46	0.53	0.60	1.00	0.22	0.22	0.22	0.22	0.22	0.22	0.22	44.56	39.53	35.38	31.91	28.97	26.44	17.72
Mauritan	0.17	0.18	0.19	0.20	0.21	0.22	0.28	0.02	0.02	0.02	0.02	0.02	0.02	0.02	13.92	13.03	12.21	11.47	10.80	10.17	7.73
	0.15	0.16	0.17	0.18	0.19	0.20	0.26														
	0.13	0.14	0.15	0.16	0.17	0.18	0.24	0.02	0.02	0.02	0.02	0.02	0.02	0.02	13.92	13.03	12.21	11.47	10.80	10.17	7.73
Niger	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Senegal	1.10	1.16	1.21	1.27	1.33	1.39	1.71	0.47	0.47	0.47	0.47	0.47	0.47	0.47	75.38	69.30	63.98	59.31	55.16	51.46	37.53
	0.63	0.68	0.74	0.80	0.85	0.91	1.25														
	0.15	0.21	0.27	0.32	0.38	0.44	0.78	0.47	0.47	0.47	0.47	0.47	0.47	0.47	75.38	69.30	63.98	59.31	55.16	51.46	37.53
Sierra Leo	0.11	0.12	0.13	0.13	0.14	0.15	0.20	0.05	0.05	0.05	0.05	0.05	0.05	0.06	80.77	74.01	68.31	63.42	59.18	55.48	41.22
	0.06	0.07	0.08	0.08	0.09	0.10	0.14														
	0.01	0.02	0.02	0.03	0.04	0.04	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.06	80.77	74.01	68.31	63.42	59.18	55.48	41.22
Togo	0.15	0.17	0.18	0.20	0.22	0.24	0.35	0.04	0.04	0.04	0.04	0.04	0.04	0.04	34.78	30.72	27.47	24.81	22.59	20.70	14.41
	0.11	0.13	0.14	0.16	0.18	0.20	0.30														
	0.07	0.09	0.10	0.12	0.14	0.16	0.26	0.04	0.04	0.04	0.04	0.04	0.04	0.04	34.78	30.72	27.47	24.81	22.59	20.70	14.41

continued

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	(1,000,000 Metric Tons)							(1,000,000 Metric Tons)							(1,000,000 Metric Tons)						
Angola	0.68	0.76	0.84	0.92	1.00	1.09	1.58	0.04	0.04	0.04	0.04	0.04	0.04	0.04	6.74	5.92	5.25	4.70	4.22	3.62	2.44
	0.63	0.71	0.79	0.88	0.96	1.05	1.54														
	0.59	0.67	0.75	0.84	0.92	1.01	1.50	0.04	0.04	0.04	0.04	0.04	0.04	0.04	6.74	5.92	5.25	4.70	4.22	3.82	2.44
Burundi	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Cameroon	0.87	0.97	1.08	1.18	1.29	1.41	2.06	0.15	0.15	0.15	0.15	0.15	0.15	0.15	21.45	18.79	16.64	14.87	13.38	12.12	7.88
	0.72	0.82	0.92	1.03	1.14	1.26	1.91														
	0.56	0.66	0.77	0.88	0.99	1.10	1.76	0.15	0.15	0.15	0.15	0.15	0.15	0.15	21.45	18.79	16.64	14.87	13.38	12.12	7.88
C A R	0.04	0.05	0.05	0.05	0.06	0.07	0.10	0.02	0.02	0.02	0.02	0.02	0.02	0.02	72.90	62.06	54.00	47.79	42.84	38.81	25.43
	0.02	0.03	0.03	0.04	0.04	0.05	0.08														
	0.01	0.01	0.01	0.02	0.02	0.03	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02	72.90	62.06	54.00	47.79	42.84	38.81	25.43
Congo	0.06	0.07	0.08	0.08	0.09	0.10	0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.01	13.36	12.03	10.93	10.01	9.22	8.55	6.20
	0.05	0.06	0.07	0.08	0.08	0.09	0.14														
	0.05	0.05	0.06	0.07	0.08	0.08	0.13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	13.36	12.03	10.93	10.01	9.22	8.55	6.20
Gabon	0.03	0.04	0.04	0.04	0.05	0.05	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01	35.03	31.67	29.00	26.84	25.05	23.54	16.88
	0.03	0.03	0.03	0.04	0.04	0.04	0.06														
	0.02	0.02	0.02	0.03	0.03	0.03	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	35.03	31.67	29.00	26.84	25.05	23.54	16.88
Rwanda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Zaire	0.17	0.17	0.16	0.15	0.14	0.13	0.09	0.17	0.17	0.16	0.15	0.14	0.13	0.09	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Botswana	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.00	22.41	19.43	16.97	14.91	13.17	11.69	7.04
	0.05	0.05	0.05	0.05	0.06	0.06	0.06														
	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.00	22.41	19.43	16.97	14.91	13.17	11.69	7.04

continued

TABLE 3.1 continued (7)

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....						
Ethiopia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Kenya	2.39	2.64	2.90	3.17	3.44	3.73	5.30	0.30	0.30	0.30	0.29	0.29	0.28	0.26	14.60	12.84	11.38	10.16	9.12	8.23	5.25
	2.09	2.34	2.60	2.87	3.16	3.45	5.03														
	1.78	2.04	2.31	2.58	2.87	3.16	4.77	0.30	0.30	0.30	0.29	0.29	0.28	0.26	14.60	12.84	11.38	10.16	9.12	8.23	5.25
Lesotho	0.27	0.29	0.31	0.33	0.36	0.38	0.51	0.05	0.05	0.05	0.05	0.05	0.05	0.04	23.63	21.34	19.35	17.59	16.04	14.66	9.67
	0.22	0.24	0.26	0.28	0.31	0.33	0.46														
	0.17	0.19	0.21	0.23	0.26	0.28	0.42	0.05	0.05	0.05	0.05	0.05	0.05	0.04	23.63	21.34	19.35	17.59	16.04	14.66	9.67
Madagascar	0.43	0.46	0.49	0.53	0.57	0.60	0.80	0.09	0.10	0.10	0.10	0.10	0.10	0.11	28.47	26.25	24.35	22.70	21.26	20.00	15.55
	0.33	0.36	0.40	0.43	0.47	0.50	0.69														
	0.24	0.27	0.30	0.33	0.37	0.40	0.59	0.09	0.10	0.10	0.10	0.10	0.10	0.11	28.47	26.25	24.35	22.70	21.26	20.00	15.55
Malawi	0.68	0.75	0.82	0.89	0.96	1.04	1.45	0.18	0.18	0.18	0.18	0.18	0.18	0.19	35.10	31.38	28.30	25.71	23.51	21.62	15.35
	0.50	0.57	0.64	0.71	0.78	0.85	1.26														
	0.33	0.39	0.46	0.52	0.60	0.67	1.06	0.18	0.18	0.18	0.18	0.18	0.18	0.19	35.10	31.38	28.30	25.71	23.51	21.62	15.35
Mauritius	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.51	2.52	2.53	2.54	2.56	2.57	3.04
	0.04	0.04	0.04	0.04	0.04	0.04	0.03														
	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.51	2.52	2.53	2.54	2.56	2.57	3.04
Mozambique	0.84	0.92	1.00	1.09	1.17	1.26	1.75	0.10	0.10	0.10	0.10	0.10	0.10	0.10	12.95	11.68	10.62	9.70	8.91	8.22	5.75
	0.75	0.82	0.91	0.99	1.08	1.17	1.65														
	0.65	0.73	0.81	0.89	0.98	1.07	1.56	0.10	0.10	0.10	0.10	0.10	0.10	0.10	12.95	11.68	10.62	9.70	8.91	8.22	5.75
Somalia	0.39	0.39	0.40	0.40	0.41	0.41	0.47	0.08	0.09	0.09	0.09	0.10	0.10	0.12	27.69	28.37	29.08	29.83	30.61	31.43	33.55
	0.30	0.31	0.31	0.31	0.31	0.32	0.35														
	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.08	0.09	0.09	0.09	0.10	0.10	0.12	27.69	28.37	29.08	29.83	30.61	31.43	33.55
Swaziland	0.10	0.11	0.12	0.13	0.14	0.15	0.19	0.01	0.01	0.01	0.01	0.01	0.01	0.00	9.46	8.10	7.00	6.09	5.32	4.68	2.58
	0.09	0.10	0.11	0.12	0.13	0.14	0.19														
	0.08	0.09	0.10	0.11	0.12	0.13	0.19	0.01	0.01	0.01	0.01	0.01	0.01	0.00	9.46	8.10	7.00	6.09	5.32	4.68	2.58

continued

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....						
Tanzania	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.c.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.c.	n.d.	n.d.	n.d.
Uganda	1.62	1.77	1.92	2.07	2.23	2.38	3.22	0.54	0.53	0.52	0.51	0.51	0.50	0.46	49.98	42.90	37.40	33.00	29.41	26.43	16.63
	1.08	1.24	1.40	1.56	1.72	1.88	2.76														
	0.54	0.71	0.87	1.04	1.21	1.39	2.30	0.54	0.53	0.52	0.51	0.51	0.50	0.46	49.98	42.90	37.40	33.00	29.41	26.43	16.63
Zambia	1.13	1.21	1.30	1.38	1.47	1.55	2.01	0.18	0.17	0.17	0.16	0.15	0.14	0.12	18.97	16.57	14.59	12.92	11.50	10.29	6.16
	0.95	1.04	1.13	1.22	1.32	1.41	1.89														
	0.77	0.87	0.97	1.07	1.17	1.26	1.77	0.18	0.17	0.17	0.16	0.15	0.14	0.12	18.97	16.57	14.59	12.92	11.50	10.29	6.16
Zimbabwe	1.57	1.68	1.80	1.92	2.05	2.18	2.89	0.66	0.65	0.65	0.64	0.64	0.63	0.61	71.90	63.15	56.02	50.11	45.13	40.89	26.65
	0.91	1.03	1.15	1.28	1.41	1.55	2.28														
	0.26	0.38	0.51	0.64	0.77	0.91	1.67	0.66	0.65	0.65	0.64	0.64	0.63	0.61	71.90	63.15	56.02	50.11	45.13	40.89	26.65
Costa Rica	0.14	0.14	0.15	0.16	0.16	0.17	0.19	0.04	0.04	0.04	0.04	0.04	0.05	0.05	42.29	41.10	40.01	39.00	38.06	37.18	35.89
	0.10	0.10	0.11	0.11	0.12	0.12	0.14														
	0.06	0.06	0.06	0.07	0.07	0.08	0.09	0.04	0.04	0.04	0.04	0.04	0.05	0.05	42.29	41.10	40.01	39.00	38.06	37.18	35.89
Dom Rep	0.27	0.28	0.29	0.29	0.30	0.31	0.32	0.05	0.05	0.05	0.05	0.05	0.05	0.06	22.12	21.93	21.76	21.67	21.50	21.40	22.48
	0.22	0.23	0.23	0.24	0.25	0.25	0.26														
	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.05	0.05	0.05	0.05	0.05	0.05	0.06	22.12	21.93	21.76	21.67	21.50	21.40	22.48
El Salv	0.32	0.32	0.33	0.33	0.34	0.34	0.36	0.12	0.13	0.13	0.13	0.14	0.14	0.16	64.73	65.54	66.43	67.40	68.47	69.62	78.63
	0.19	0.19	0.20	0.20	0.20	0.20	0.20														
	0.07	0.07	0.07	0.06	0.06	0.06	0.04	0.12	0.13	0.13	0.13	0.14	0.14	0.16	64.73	65.54	66.43	67.40	68.47	69.62	78.63
Guatemala	0.26	0.28	0.29	0.31	0.33	0.35	0.44	0.08	0.08	0.09	0.09	0.09	0.09	0.11	44.54	42.68	40.98	39.42	37.98	36.65	32.51
	0.18	0.19	0.21	0.22	0.24	0.25	0.33														
	0.10	0.11	0.12	0.13	0.15	0.16	0.22	0.08	0.08	0.09	0.09	0.09	0.09	0.11	44.54	42.68	40.98	39.42	37.98	36.65	32.51
Haiti	0.42	0.46	0.50	0.54	0.59	0.63	0.89	0.04	0.04	0.04	0.04	0.04	0.04	0.04	10.55	9.55	8.69	7.95	7.31	6.75	4.72
	0.38	0.42	0.46	0.50	0.55	0.59	0.85														
	0.34	0.38	0.42	0.46	0.51	0.55	0.81	0.04	0.04	0.04	0.04	0.04	0.04	0.04	10.55	9.55	8.69	7.95	7.31	6.75	4.72

continued

TABLE 3.1 continued (9)

	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000	1990	1991	1992	1993	1994	1995	2000
	..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....							..... (1,000,000 Metric Tons) .....						
Honduras	0.35	0.38	0.41	0.43	0.46	0.49	0.67	0.07	0.07	0.07	0.07	0.07	0.07	0.08	23.44	21.86	20.46	19.21	18.09	17.07	12.99
	0.29	0.31	0.34	0.36	0.39	0.42	0.59														
	0.22	0.24	0.27	0.29	0.32	0.35	0.51	0.07	0.07	0.07	0.07	0.07	0.07	0.08	23.44	21.86	20.46	19.21	18.09	17.07	12.99
Jamaica	0.24	0.25	0.26	0.28	0.29	0.30	0.37	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.90	3.65	3.44	3.25	3.08	2.92	2.34
	0.23	0.24	0.25	0.27	0.28	0.30	0.36														
	0.22	0.23	0.25	0.26	0.27	0.29	0.36	0.01	0.01	0.01	0.01	0.01	0.01	0.01	3.90	3.65	3.44	3.25	3.08	2.92	2.34
Nicaragua	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.04	0.03	0.01	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Parana	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.03	136.96	124.71	114.23	105.16	97.23	90.25	97.15
	0.02	0.02	0.02	0.02	0.03	0.03	0.03														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.03	100.00	100.00	100.00	100.00	97.23	90.25	97.15
Tri Tob	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Bolivia	0.50	0.53	0.56	0.59	0.62	0.65	0.81	0.13	0.13	0.13	0.13	0.13	0.13	0.14	34.04	32.06	30.28	28.66	27.23	25.91	20.57
	0.38	0.40	0.43	0.46	0.48	0.51	0.67														
	0.25	0.27	0.30	0.33	0.36	0.38	0.53	0.13	0.13	0.13	0.13	0.13	0.13	0.14	34.04	32.06	30.28	28.66	27.23	25.91	20.57
Colombia	0.36	0.33	0.29	0.25	0.21	0.16	0.00	0.36	0.33	0.29	0.25	0.21	0.16	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Ecuador	0.63	0.70	0.77	0.84	0.92	1.00	1.41	0.11	0.11	0.11	0.11	0.11	0.10	0.10	21.78	18.87	16.55	14.64	13.06	11.72	7.46
	0.52	0.59	0.66	0.74	0.81	0.89	1.31														
	0.40	0.48	0.55	0.63	0.71	0.79	1.21	0.11	0.11	0.11	0.11	0.11	0.10	0.10	21.78	18.87	16.55	14.64	13.06	11.72	7.46
Guyana	0.03	0.03	0.02	0.02	0.01	0.01	0.00	0.03	0.03	0.02	0.02	0.01	0.01	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	0.00	0.00	0.00	0.00	0.00	0.00	0.00														
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

continued



**TABLE 3.2** Basis of Classification of Countries According to the Positive or Negative Character of their Food Aid Requirements (Before Application of the Constraint on Negative Values)

Class	Estimate		
	Upper Limit	Average	Lower Limit
A	+	+	+
B	+	+	-
C	+	-	-
D	-	-	-

that with the lowest (16.2%) is Latin America. Among sub-regions, the highest positive percentage difference (49.3%) is for West Asia and the lowest (9%) is for Central America.

For reasons set out in Chapter II, there is considerable justification for imposing an income constraint on recipients of food aid. An upper limit on per capita GNP of \$800 was suggested. Low-income countries, that is those with a lower per capita GNP than \$800 in 1980, need to be examined for the variability of food aid requirements for the world and for the regions and sub-regions into which they fall. The results are presented in Table 3.4. This table shows that total food aid requirement for all low-income countries varies in 1990 from 23.3 million tons to 16.32 million tons around the trend requirement of 19.2 million tons. The positive percentage difference is 16.14% and the negative percentage difference is 15%. The percentage differences are not defined for South America because its trend requirement is nil. Similarly, these differences are extremely high for East Asia because the trend requirement is extremely small (particularly so, relative to the volume of domestic production). Amongst the other sub-regions, the highest positive percentage difference is 43.31% for South Asia and the lowest is 11.1% for North Africa. Figure 3.1 shows the percentage variability of different regions and sub-regions for 1990, 1995 and 2000.

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**TABLE 3.3 Variability of Food Aid Needs for Regions and Sub-Regions: Trend, Upper and Lower Estimates**

	Row 1: Upper Estimate, based on (Production - 1 S.D.)			Difference from Basic Estimates (row 2)			Percentage Difference from Basic Estimates		
	1990	1995	2000	1990	1995	2000	1990	1995	2000
							n.d. not defined		
	(1,000,000 Metric Tons)								
SOUTH ASIA	3.50	4.12	4.23	1.06	1.22	1.41	43.26	42.00	49.72
	2.44	2.90	2.83						
	1.38	1.68	1.43	1.07	1.22	1.40	43.58	42.07	49.55
EAST ASIA	3.34	3.21	2.19	0.96	0.99	1.01	40.58	44.36	84.92
	2.38	2.22	1.19						
	1.45	1.29	0.26	0.93	0.93	0.93	39.01	41.83	78.41
ASIA	6.13	6.58	5.64	1.31	1.46	1.63	27.24	28.49	40.55
	4.82	5.12	4.01						
	3.54	3.69	2.42	1.29	1.43	1.60	26.67	27.92	39.80
WEST ASIA	5.06	7.45	10.48	1.67	1.95	2.33	49.33	35.43	28.55
	3.39	5.50	8.15						
	2.90	5.05	7.75	0.49	0.45	0.40	14.51	8.10	4.96
NORTH AFRICA	14.35	20.19	26.95	1.57	1.61	1.66	12.33	8.69	6.58
	12.77	18.58	25.28						
	11.20	16.96	23.62	1.57	1.61	1.66	12.33	8.69	6.58
W. ASIA/N. AFRICA	18.95	27.04	36.63	2.79	2.97	3.20	17.28	12.32	9.56
	16.16	24.08	33.44						
	14.28	22.17	31.50	1.88	1.90	1.94	11.62	7.90	5.79
WEST AFRICA	4.58	6.68	9.17	1.10	1.15	1.22	31.43	20.87	15.41
	3.49	5.53	7.95						
	2.41	4.39	6.75	1.08	1.14	1.20	30.99	20.53	15.12

continued

TABLE 3.3 continued

	1990	1995	2000	1990	1995	2000	1990	1995	2000
..... (1,000,000 Metric Tons) .....									
CENTRAL AFRICA	1.79	2.84	4.11	0.33	0.36	0.39	22.65	14.36	10.42
	1.46	2.49	3.72						
	1.27	2.30	3.53	0.19	0.19	0.19	13.05	7.63	5.10
EAST AFRICA	8.49	12.85	17.82	1.19	1.16	1.14	16.26	9.94	6.86
	7.31	11.69	16.67						
	6.12	10.53	15.53	1.19	1.16	1.14	16.26	9.94	6.86
SUB-SAHARAN AFRICA	14.38	21.90	30.62	2.13	2.19	2.27	17.36	11.12	8.02
	12.25	19.71	28.34						
	10.29	17.73	26.33	1.97	1.98	2.01	16.05	10.05	7.09
CENTRAL AMERICA	1.74	2.33	2.94	0.14	0.16	0.18	9.03	7.35	6.35
	1.60	2.17	2.77						
	1.46	2.01	2.60	0.14	0.16	0.17	8.95	7.26	6.26
SOUTH AMERICA	3.28	4.65	6.05	0.69	0.75	0.83	26.75	19.39	15.89
	2.59	3.89	5.22						
	2.20	3.51	4.85	0.38	0.38	0.37	14.85	9.71	7.12
LATIN AMERICA	4.86	6.80	8.80	0.68	0.74	0.81	16.18	12.22	10.20
	4.19	6.06	7.99						
	3.73	5.65	7.56	0.40	0.41	0.43	9.45	6.81	5.42
TOTAL	42.29	60.18	79.42	4.86	5.21	5.64	13.00	9.49	7.64
	37.42	54.96	73.78						
	33.57	50.92	69.51	3.85	4.04	4.27	10.29	7.35	5.79

**TABLE 3.4 Low Income Countries: Variability of Food Aid Needs for Regions and Sub-Regions: Trend, Upper and Lower Estimates**

	Row 1: Upper Estimate, based on (Production - 1 S.D.)			Difference from Basic Estimates (row 2)			Percentage Difference from Basic Estimates		
	1990	1995	2000	1990	1995	2000	1990	1995	2000
	(1,000,000 Metric Tons)								
SOUTH ASIA	3.51	4.12	4.23	1.06	1.22	1.40	43.31	42.05	49.59
	2.45	2.90	2.83						
	1.39	1.68	1.43	1.06	1.22	1.40	43.31	42.05	49.59
EAST ASIA	0.44	0.50	0.50	0.40	0.43	0.47	989.92	618.82	1582.56
	0.04	0.07	0.03						
	0.00	0.00	0.00	0.04	0.07	0.03	100.00	100.00	100.00
ASIA	3.67	4.32	4.40	1.18	1.35	1.54	41.25	45.34	53.99
	2.49	2.97	2.86						
	1.43	1.75	1.46	1.06	1.22	1.40	47.61	41.06	49.07
WEST ASIA	0.78	1.21	1.72	0.12	0.11	0.10	18.48	9.94	6.06
	0.66	1.10	1.62						
	0.54	0.99	1.52	0.12	0.11	0.10	18.48	9.94	6.08
NORTH AFRICA	8.03	11.38	15.73	0.80	0.86	0.92	11.10	8.16	6.21
	7.23	10.52	14.81						
	6.43	9.66	13.89	0.80	0.86	0.92	11.10	8.16	6.21
W. ASIA/W. AFRICA	8.80	12.58	17.45	0.91	0.96	1.02	11.47	8.27	6.22
	7.89	11.62	16.43						
	6.98	10.66	15.41	0.91	0.96	1.02	11.47	8.27	6.22
WEST AFRICA	3.21	4.66	6.40	0.94	0.98	1.03	41.35	26.62	19.10
	2.27	3.68	5.37						
	1.35	2.72	4.37	0.92	0.96	1.00	40.62	26.05	18.61
CENTRAL AFRICA	1.05	1.65	2.36	0.31	0.34	0.37	41.29	25.58	18.51
	0.74	1.31	1.99						
	0.57	1.14	1.82	0.17	0.17	0.17	22.64	12.88	8.55
EAST AFRICA	6.26	9.13	12.42	1.12	1.10	1.09	21.81	13.70	9.59
	5.14	8.03	11.33						
	4.02	6.93	10.24	1.12	1.10	1.09	21.81	13.70	9.59
SUB-SAHARAN AFRICA	10.09	15.02	20.76	1.94	2.00	2.07	23.76	15.34	11.10
	8.15	13.02	18.69						
	6.39	11.26	16.91	1.76	1.76	1.78	21.55	13.53	9.50
CENTRAL AMERICA	0.75	1.10	1.53	0.08	0.09	0.09	12.22	8.43	6.15
	0.67	1.01	1.44						
	0.60	0.93	1.36	0.07	0.08	0.08	10.84	7.51	5.51
SOUTH AMERICA	0.03	0.01	0.00	0.03	0.01	0.00	n.d.	n.d.	n.d.
	0.00	0.00	0.00						
	0.00	0.00	0.00	0.00	0.00	0.00	n.d.	n.d.	n.d.
LATIN AMERICA	0.75	1.09	1.53	0.08	0.08	0.09	11.92	8.38	6.25
	0.67	1.01	1.44						
	0.60	0.93	1.36	0.07	0.08	0.08	10.84	7.51	5.51
TOTAL	22.30	31.97	43.06	3.10	3.35	3.64	16.14	11.70	9.23
	19.20	28.62	39.42						
	16.32	25.53	36.08	2.88	3.09	3.34	14.99	10.80	8.48

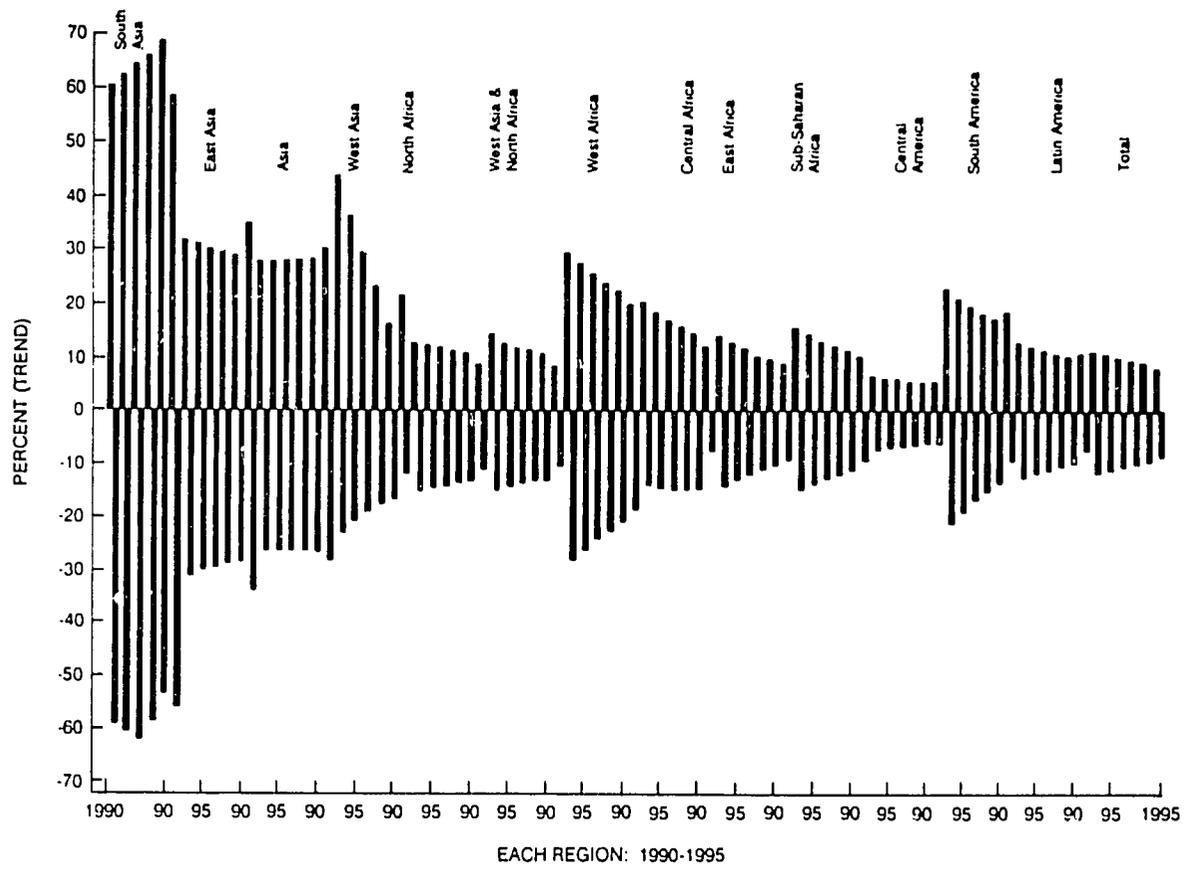


FIGURE 3.1 Percentage Difference of Upper and Lower Estimates of Food Aid Requirements from Basic Trend Estimates for Regions and Sub-regions