COLIN KIRKPATRICK AND DIMITRIS DIAKOSAVVAS

Food Insecurity and the Foreign Exchange Constraint in Sub-Saharan Africa

I. INTRODUCTION

The problem of food insecurity in less developed countries (LDCs) continues to demand the attention of the international community. Despite the progress that has been made in increasing world production of cereals and other major foodstuffs, many LDCs continue to face immense difficulties in ensuring an adequate level of food supplies on a regular year-to-year basis. The current African food crisis has once again demonstrated the vulnerability of low income economies to a sudden shortfall in food supplies and has highlighted the need for additional measures to strengthen food security in the Third World. Despite a significant increase in food imports, the growth in consumption in sub-Saharan Africa was less than that of population, with consumption per caput declining over the last two decades (Mellor and Johnston 1984).

The problem of food insecurity has a long-term and a short-term dimension. The longer-term aspect relates to the chronic and persistent malnutrition of significant sections of the population in many LDCs, while the shorter-term insecurity is caused by year-to-year fluctuations in food consumption levels.

The focus of the present paper is upon the second dimension of food insecurity. The paper seeks to identify the extent to which short-run changes in the level of food imports have offset shortfalls in domestic production, thereby protecting consumption levels. The paper is structured as follows. Section II presents some evidence of the foreign exchange burden of food imports in sub-Saharan Africa. Section III develops the paper's main argument, that fluctuations in food consumption levels per caput are related to the difficulties that low-income countries face in financing the shortfalls in domestic production and/or increases in the price of imports. Empirical evidence relating to a sample of 30 African economies for the 1965–83 period is presented in Section IV. Section V contains a brief summary and concluding comments.

II. RECENT TRENDS IN FOOD IMPORTS[1]

International trade is an increasingly important element in the food supply

equation of many low-income countries, with commercial imports and food aid accounting for a significant share of total consumption. This growing dependence on food imports, and the short-term insecurity problems with which it is associated, are particularly acute in sub-Saharan Africa. Empirical evidence indicates that cereal imports by this region have increased more rapidly than for the LDCs as a whole (Huddleston 1984). Commercial imports rose by 63 per cent between 1976–8 and 1981, while the share of food aid in total imports increased from 18 to 23 per cent over the same period. The foreign exchange burden of food imports varies both across countries and over time. Table 1 shows that for a sample of 30 sub-Saharan countries covering the period 1965–83, expenditure on cereal imports accounted for more than 10 per cent of export earnings in half the sample economies. In particular years, the share of cereal costs in export revenues exceeded 25 per cent in 13 countries. Thus, for many African economies,

TABLE 1 *Cereal imports as share of total merchandise exports in African economies, 1965–83 (%)*

Country	Mean	Maximum
Benin	22.0	77.2 (1982)
Botswana	19.1	66.2 (1968)
Burkina Faso	26.3	66.9 (1978)
Cameroon	4.6	6.1 (1983)
Central African Republic	5.2	9.2 (1975)
Chad	6.0	16.2 (1974)
Ethiopia	6.4	16.1 (1980)
Gambia	15.3	37.3 (1981)
Ghana	5.1	9.5 (1983)
Guinea	10.2	18.0 (1973)
Ivory Coast	4.2	7.3 (1981)
Kenya	2.3	6.2 (1982)
Lesotho	67.3	127.3 (1977)
Madagascar	11.6	34.4 (1982)
Malawi	4.2	15.6 (1970)
Mali	19.2	96.8 (1974)
Mauritania	11.2	22.9 (1978)
Mauritius	15.2	22.3 (1969)
Mozambique	10.5	27.3 (1977)
Niger	8.0	47.2 (1974)
Rwanda	10.1	18.0 (1982)
Senegal	20.6	35.4 (1973)
Sierra Leone	12.4	32.3 (1982)
Somalia	29.5	77.1 (1981)
Sudan	6.5	11.9 (1980)
Tanzania	9.3	30.4 (1975)
Togo	5.1	10.2 (1981)
Uganda	2.2	4.5 (1982)
Zaire	7.6	23.8 (1981)
Zambia	2.9	10.1 (1980)

expenditure on food imports, is a serious strain on the balance of payments.

III. FOOD CONSUMPTION INSTABILITY AND THE FOREIGN EXCHANGE CONSTRAINT

Short-term food insecurity arises from two interrelated sources – domestic production and foreign exchange availability. Fluctuations in production are an obvious potential source of insecurity, but on their own they are neither necessary nor sufficient to generate food insecurity. In a world of perfect capital markets a country which experienced a production shortfall could simply borrow in international markets to finance additional imports and repay these loans when production returned to normal levels. In practice, there are a variety of economic and institutional factors which make such a simple solution impossible.[2] These can be summarised as representing a foreign exchange constraint. A constraint on the availability of foreign exchange causes food insecurity by limiting a country's ability to buy on the international market in order to stabilise consumption in years of production shortfalls. In the same way, a tightening of the foreign exchange constraint through a rise in the world price of food imports, or a decline in export earnings, will impact directly on food security.[3] The effect of fluctuations in production and import prices on food insecurity can be manifested in a variety of ways. Consider a country which is faced with a shortfall in food production and a severe foreign exchange constraint. Such a country may attempt to sustain domestic food consumption levels, or at least moderate the decline in consumption, by various means. These could most obviously include: drawing on existing food reserves, reducing food exports, obtaining increased food aid, or increasing food imports.

In practice, the choice among such measures is likely to be severely limited. In the majority of low-income food-importing countries domestic food stocks are either non-existent or much below target (IWC 1983). Empirical analysis has shown the lack of correspondence between food aid inflows and the import needs of individual LDCs (Huddleston 1981). Reducing food exports is obviously not an option available to a majority of LDCs. An increase in commercial food imports will have a high opportunity cost, since it can only be financed by a cutback in non-food imports, many of which are essential for sustaining the development effort.

The *a priori* expectation is therefore that the majority of low-income food deficit countries will be unable to increase significantly their year-to-year food imports in response to a sudden decline in domestic production or increase in the price of food imports. The result is likely to be downward adjustments in consumption standards.

Many sub-Saharan economies have indeed experienced considerable short-run variability in consumption levels. Table 2 displays the estimated coefficients of variation in cereals consumption per caput for 30

TABLE 2   *Instability in food consumption per caput in sub-Saharan Africa, 1965–83*

Country	Coefficient of Variation[1] %	Probability of a given percentage shortfall 5%	2.5%
Benin	10.6	31.9	40.7
Botswana	9.6	29.7	39.7
Burkina Faso	10.2	30.9	40.2
Cameroon	30.5	43.7	46.7
Central African Republic	10.6	31.5	40.5
Chad	7.8	25.8	37.2
Ethiopia	10.3	30.9	40.2
Gambia	15.5	37.2	43.5
Ghana	21.5	40.6	45.3
Guinea	10.3	30.9	40.2
Ivory Coast	5.9	19.1	33.4
Kenya	10.0	30.6	40.0
Lesotho	20.2	40.1	44.9
Madagascar	4.2	10.6	26.6
Malawi	10.1	30.6	40.0
Mali	12.1	33.6	41.6
Mauritania	11.6	33.2	41.4
Mauritius	32.5	43.5	46.8
Mozambique	9.7	30.1	39.8
Niger	15.1	36.6	43.2
Rwanda	9.8	29.9	39.6
Senegal	20.4	40.2	45.0
Sierra Leone	8.1	26.2	37.5
Somalia	20.2	39.9	44.9
Sudan	17.7	38.5	44.2
Tanzania	14.6	36.0	42.9
Togo	12.5	34.2	41.9
Uganda	14.9	36.8	43.3
Zaire	9.3	28.9	39.0
Zambia	22.1	40.8	45.4

[1]The data are trend adjusted cereal consumption per caput.

countries during the period 1965–83. The results indicate sizeable cross-country variation, ranging from 4.2 per cent in Madagascar to 32.5 per cent in Mauritius. An alternative way of representing this variability in consumption is to compute the probability of consumption falling below trend by more than a given percentage. Columns 2 and 3 of Table 2 show the probabilities that actual consumption per caput falls below 95 per cent and 97.5 per cent of trend. For 28 countries a shortfall in consumption per head of more than 5 per cent occurs with a 25 per cent probability, that is, once every four years. When we consider shortfalls in consumption per head of at least 2.5 per cent, however, only Madagascar did not experience such a shortfall one year in three, and all the countries in the sample experienced a shortfall one year in four. Where the shortfall is unevenly distributed, the impact upon the already

uneven consumption pattern can be severe for the poorest sections of the population, and under plausible assumptions, an average shortfall of 2.5 per cent could translate into a shortfall of 10 per cent for as much as 30 per cent of the adult population (Green and Kirkpatrick 1982).

To summarise, the relationship between food production, imports and consumption cannot be analysed in isolation from the balance of payments position. If a country faces a foreign exchange constraint, the *ex post* data on the volume of food imports will provide a poor indicator of the country's food import requirements, and it would be a misleading simplification to interpret a low level of short-run variation in food imports as evidence of the absence of a food insecurity problem.

IV. EMPIRICAL EVIDENCE ON THE USE OF IMPORTS TO ATTAIN FOOD SECURITY

The analysis of the way in which imports respond to changes in domestic production and world prices is undertaken in two stages. First, an estimate is made of how food imports have responded to variations in domestic production and international prices; second, the relationship between consumption instability and foreign exchange availability is examined. The data used consisted of FAO statistics on production, consumption and trade in cereals. Price data were taken from World Bank (1984) and refer to the real international price of cereals.[4]

To evaluate how food imports have responded to changes in domestic production and world prices the following equation was estimated:

$$(M_t - \hat{M}_t) = a_1(Q_t - \hat{Q}_t) + a_2(P_t - \hat{P}_t) \qquad (1)$$

where M_t = volume of cereal imports in year t
Q_t = domestic production of cereals in year t
$\hat{M}_t$, $\hat{Q}_t$ and $\hat{P}_t$ denote the linear trend estimated values of the variables in year t.[5]

The coefficients a_1 and a_2 reflect the extent to which variability in domestic food production and world market price are reflected in adjustments in food imports. If fluctuations in domestic production are totally offset by trade, then the coefficient of the production variable, a_1, will be equal to minus unity. If a_1 is different than minus one then domestic production shortfalls are not completely offset by trade and some adjustments have to be made in domestic consumption. The price coefficient, a_2, captures the extent to which short-run fluctuations in international food prices create adjustments in food imports. Again, we would expect to find an inverse relationship, implying that as prices rise imports are reduced.

The results obtained when equation (1) was estimated are shown in Table 3. As can be seen, the coefficient of production is correctly signed in the majority of cases, and in all cases is (statistically) significantly

different from minus one. It can be argued, therefore, that trade has not made a significant contribution to food security and a significant proportion of production variability is likely to have been transmitted directly to consumption instability. The price coefficient estimates are less satisfactory. The coefficient is correctly signed in 14 cases, and is statistically significant in only two cases. There are six instances of statistically significant positive coefficients, a result consistent with consumption stabilising behaviour. One possible explanation for the apparent unresponsiveness of imports to cereal price changes might be that, contrary to our *a priori* expectations, countries managed to stabilise import volumes despite price volatility, and adjusted the level of non-food imports accordingly. A more plausible explanation is that the price variable is a poor proxy for the change in the foreign exchange constraint. If, for example, the increase in world food prices is part of a general increase in commodity prices, increased export earnings may offset the adverse effect of food prices on foreign exchange purchasing capacity.

The finding that cereal imports by sub-Saharan countries have been unresponsive to variations in domestic production is consistent with the results reported in several recent studies for LDCs as a whole. Morrison's (1984) study of the pattern of LDCs' cereal imports concluded that short-term factors were relatively unimportant determinants, as compared to long-term structural factors such as the level of income per caput and the degree of urbanisation. Of particular interest for the present study is Morrison's failure to find a statistically significant relationship between fluctuations in domestic cereals production and cereals imports per caput. Blandford's (1983) study reports estimated values of the production coefficient, a_1, for different country groupings. For the low-income LDCs group the coefficients for wheat and coarse grains imports over the period 1960–81 were -0.41 and -0.12 respectively. In other words, significantly less than half of the variation in domestic production was transmitted to imports.

The second stage in the empirical exercise was to examine directly the impact of foreign exchange availability on food security. To do this, deviations in food consumption from 'target' levels were regressed on the ratio of 'food security' costs to export earnings. Food security imports (M_t^*) are defined as the volume of imports needed to close the gap between target consumption ($\hat{C}_t$) and domestic food production (Q_t). The cost of food security imports can be written as:

$$M_t^* = (\hat{C}_t = Q_t) P_t$$

where $\hat{C}_t$ = the target level of consumption, defined as the esti-
mated trend value[6]

Q_t = domestic food production

P_t = real international food price.

To allow for movements in overall foreign exchange availability, the cost of food security imports is expressed as a ratio of real total export

TABLE 3   *Results of regression analysis*

Country	Import Equation a_1	Import Equation a_2	Consumption Equation b_1
Benin	−.025	72.162	−2.456
	(28.327)**	(0.890)	(7.081)**
Botswana	−0.014	−180.367	−3.025
	(10.935)**	(1.685)	(3.710)**
Burkina Faso	−0.002	437.218	−3.004
	(29.748)**	(3.410)**	(10.329)**
Cameroon	−0.322	−179.199	−12.464
	(17.900)**	(2.033)*	(2.475)**
Central African	−0.56	1.409	−3.841
Republic	(36.117)**	(0.015)	(13.032)**
Chad	0.277	−29.500	−4.265
	(6.582)**	(1.257)	(3.778)**
Ethiopia	0.014	−358.072	−18.102
	(37.083)**	(0.733)	(9.171)**
Gambia	−0.015	−28.983	−2.589
	(14.998)**	(0.872)	(7.898)**
Ghana	−0.032	177.470	−45.113
	(19.246)**	(0.626)	(8.534)**
Guinea	0.002	100.640	−10.738
	(53.946)**	(3.079)**	(6.362)**
Ivory Coast	−0.281	−14.478	−59.839
	(9.559)**	(0.059)	(3.771)**
Kenya	−0.163	72.182	−35.712
	(20.767)**	(0.116)	(3.200)**
Lesotho	−0.078	−107.771	−1.026
	(13.095)**	(0.794)	(7.563)**
Madagascar	−0.027	−15.053	−18.504
	(51.370)**	(0.273)	(15.458)**
Malawi	−0.095	−8.949	−6.836
	(30.501)**	(0.050)	(5.503)**
Mali	−0.025	121.488	−8.119
	(23.291)**	(6.312)**	(8.436)**
Mauritania	−0.799	379.417	0.119
	(13.244)**	(4.019)**	(0.060)
Mauritius	−0.743	2.762	1.437
	(6.764)**	(0.135)	(0.440)
Mozambique	−0.237	−97.020	−6.966
	(8.415)**	(0.250)	(2.680)**
Niger	0.023	101.025	−4.985
	(34.911)**	(4.752)**	(6.168)**
Rwanda	−0.005	−5.637	−2.841
	(70.774)**	(0.410)	(8.682)**
Senegal	0.006	177.041	−16.727
	(16.007)**	(0.497)	(4.906)**
Sierra Leone	0.038	100.417	−10.883

TABLE 3   *Results of regression analysis (cont.)*

	(15.262)**	(1.096)	(12.040)**
Somalia	0.956	610.722	−5.396
	(8.596)**	(1.706)	(3.096)**
Sudan	−0.030	−381.688	−32.832
	(40.262)**	(0.981)	(22.050)**
Tanzania	0.033	171.081	−35.519
	(12.727)**	(2.077)*	(5.904)**
Togo	−0.116	−188.541	−6.982
	(18.846)**	(2.603)**	(8.105)**
Uganda	−0.007	9.755	−20.949
	(48.433)**	(0.061)	(9.033)**
Zaire	−0.534	111.703	−4.006
	(3.307)**	(1.781)	(0.468)
Zambia	−0.129	−101.049	−50.667
	(17.118)**	(1.466)	(4.101)**

[1]The numbers in parenthesis under the coefficients are the t-ratios. Stars stand for confidence (risk) levels of the two-tail test: * 5% ** 1%.

earnings (X_t).[7]
   The equation was estimated in the following form:

$$(C_t - \hat{C}_t) = b_0 + b_1 \frac{M_t^*}{X_t} \qquad (2)$$

The coefficient b_1 is expected to have a negative sign. If the cost of 'food security imports' increases (due either to a domestic production shortfall or an increase in the world price), or export earnings fall, then a country will find it more difficult to stabilise consumption.
   The results displayed in the right-hand signed column of Table 3 show that the coefficient of 'food security imports' is correctly signed and statistically significant at the one per cent level in all but three cases (Mauritania, Mauritius, Zaire). On average a ten per cent change in the cost of 'food security imports' has led to 2.12 per cent change in food consumption. Of the 30 countries included in the sample, only two fail to show the predicted inverse relationship (Mauritania, Mauritius).
   Given the unsophisticated nature of the testing procedures employed, and the poor quality of the data, the results in Table 3 are encouraging. They provide strong support for the argument that limited foreign exchange availability has been a constraint upon the ability of sub-Saharan countries to obtain the level of food imports needed to ensure short run food security, and has therefore contributed directly to the significant year to year fluctuations in consumption experienced by these economies.

CONCLUSION
In this paper it has been argued that the short term insecurity problem in sub-Saharan Africa, as evidenced by high levels of consumption

variability, is the direct result of a foreign exchange constraint which limits the ability of low-income countries to adjust their level of food imports in response to shortfalls in domestic production and/or variations in international food prices. Section IV provided strong empirical evidence consistent with this hypothesis.

An important qualificiation to this paper relates to the aggregate nature of the analysis. There is considerable diversity in the experience of individual economies, and the importance of any particular factor in explaining food consumption instability will vary across countries. Furthermore, the impact of a given variation in consumption or imports will depend, *inter alia*, on the existing level of consumption per caput, the share of food imports in total consumption and the share of 'essential' imports in total non-food imports. It is recognised that these complexities are not captured by cross-section analysis, and the sources of food insecurity in individual countries require further detailed study.

Nevertheless, we believe that the analysis presented in the paper provides a new perspective to the serious food insecurity problems of sub-Saharan Africa and has important implications for international food security policy. The international community can play a significant role in the alleviation of food insecurity through the provision of concessionary finance for the funding of exceptional food import requirements. The IMF's 'Food Facility', which is specifically designed to help members with balance of payments difficulties to finance an increase in cereal imports, is one channel through which assistance can be provided. The use of the IMF's Buffer Stock Financing Facility to finance the setting up of food security reserves would be a further means of alleviating the short-term foreign exchange constraint on food security (Kirkpatrick 1985). Improving the LDCs' capacity to finance short-term fluctuations in food requirements will not eliminate the food security problem. Domestic policies towards income maintenance, pricing and distribution of food supplies will also play an important role in determining the degree of consumption instability and deprivation experienced by vulnerable sections of the population. But taken in conjunction with appropriate internal policies, increased financial assistance by the international community could make a significant contribution to the reduction of food insecurity in sub-Saharan Africa.

NOTES

[1]In the rest of the paper we refer to 'food' and 'cereals' interchangeably. In the majority of developing countries both the share of human consumption in total cereal consumption and the share of cereals in total foodstuffs consumption (measured in calorie intake), is high (FAO 1977, Tables I.1.3 and I.4.1). In addition, world trade in foodstuffs consists mainly of cereals.

[2]The consideration that food insecurity is in part related to inperfections in world capital markets suggests the relevance of intervention by international lending agencies in alleviating international food insecurity. See Green (1983) on this point.

[3]There is evidence to suggest that the variability of both cereals production and prices has increased in recent years. See Hazell (1984) and Blandford (1983).

[4]Real cereal prices were obtained by deflating nominal prices by the World Bank manufacturing unit value index.

[5]Equation (1) has been derived from a simple free trade model.

[6]The trend value of consumption was defined in terms of a permanent income consumption function. A detailed description of the procedure used is given in Diakosavvas (1983).

[7]Nominal exports were deflated by import unit values from IMF's *Financial Statistics*, to derive real export earnings series.

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DISCUSSION OPENING – L. A. MSAMBICHAKA

Both papers bring enormous work and concern to the problem of food in Africa. These two good papers have attempted to present the following:

(i) The food security and insecurity situation which by facts and figures is said to be disastrous.

(ii) The causes of the situation.

(iii) Remedial measures as well as a suggested research agenda (first paper).

Notwithstanding the above observations, however, I would like to raise the following issues for discussion as well as an emphasis to the information provided in the two papers.

On the Eicher and Staatz paper:

1. Sub-Saharan Africa's ability to feed itself
It is true that many sub-Saharan African countries were before independence net exporters of food or at least they could meet their own domestic demands. This ability has over the years been eroded and many of these countries are now almost permanently net importers. Despite the fact that reasons behind this anomaly do substantially vary from country to country, is there a common denominator to the problem? In other words has the inability to feed oneself got anything to do with the following?

(a) the national agricultural policies:
   —wrong policies were prepared
   —wrong emphasis in wrong areas was made or
   —wrong priorities were made
(b) the mismanagement of the agricultural sector (food and cash)
(c) external factors: for example, Aid Donors have over the years provided assistance in wrong areas of the national economy and at the wrong time. This has compounded the problems inherent in the food sector.
(d) Inability to predict and plan for the future.

2. Nutrition and vulnerable groups
No one would dispute the fact that the issue of nutrition is important. However as the situation is now in Africa and given the level of development we have, what could we consider as the major point of departure for our discussion? Is it the food production, availability or accessibility problem which African countries and agricultural economists should attempt to discuss and look for alternative solutions? I pose this question for the following reasons:

(a) Sub-Saharan Africa is basically made up of a poor rural population.
(b) With the exception of a few countries, most of the food is produced by the majority of the population who are the rural poor.
(c) Sub-Saharan Africa's potential natural resources are enormous.

In such a situation when the majority poor are the majority of producers, land resource is not a threatening problem and yet food is in severe shortage. What should be the issue for discussion? The truth is that

many households are not capable of producing enough for themselves, let alone for the market. I would imagine that for sub-Saharan Africa and given the state of our development, the problem is at the production level and the ability to use reasonably what has been produced.

On the Diakosavvas and Kirkpatrick paper:

1. Food consumption
Financing capability of food imports. In years of foreign exchange constraint one would expect less of commercial food imports. Nevertheless there are countries which import enormous amounts of food even when their foreign exchange situation is in a precarious situation. How can this be explained? Is it because of political and humanistic reasons?

2. Food insecurity
Discussions on food security/insecurity are being conducted in various countries in Africa and the respective sub-regions. In a span of 12 months I have attended about four meetings which were discussing food crisis at a national, sub-regional and the entire African level. In each meeting food crisis has always been equated with 'cereals or grain crisis'. The role of traditional crops such as bananas, cassava, yams, sweet potatoes, etc. in ensuring food security has never been treated exhaustively. How correct are we as agricultural economists to neglect these foods which could substantially reduce the magnitude of human disaster? Agricultural economists would do a greater service to human development in Africa if they sorted out ways and means of propagating the traditional foods by way of improving productivity, transport and storage logistics as well as their preparations.

3. Imports per caput v. consumption per caput
Most of the countries in the sub-Saharan region import food. Many of these countries have rural transport problems which have a direct negative impact on the distribution system. Quantitative food import per caput figures show a rising trend and so are the figures for consumption per caput.
  Despite these rather impressive figures, we note an increasing number of malnourished children and expectant mothers who suffer from nutritional anaemia and face maternal death. How can these be explained?

4. Food aid imports v. commercial food imports
Food aid imports in developing countries declined during 1961–3, 1976–8 and 1981. Regionwise, food imports in sub-Saharan Africa have been on an upward trend. However the region received less aid than each of the areas discussed, except for 1976–8 when it received more than Latin America. However total food aid received by sub-Saharan Africa during

the period under discussion was about 10 per cent of the total. A combined volume of food aid to Latin America and sub-Saharan Africa accounted for around ⅕ of the total food to developing countries.

Except for sub-Saharan Africa, where a parallel increase in both commercial and food aid imports took place, in other regions the trend was in opposite directions. The questions which can be derived out of this trend are twofold:

   (a) Food prices have been volatile over the years and yet commercial imports have been rising and food aid declining. Are developing countries putting more and more of their foreign exchange resources into food imports rather than other non-food imports?

   (b) Does the declining trend of food aid to developing countries indicate that donors are increasingly becoming more reluctant to extend food aid to the developing countries?

Many questions could be derived from Table 3, but I hope participants will be able to raise them.

In conclusion I wish to make the following observations:

   (1) Since independence African governments have not seriously addressed their policies towards the problem of food and human nutrition. Many countries have no 'food and nutrition policy'. This is a big drawback in human development.

   (2) Food aid has not made a significant contribution to the promotion and stabilisation of domestic food production in sub-Saharan Africa.

   (3) Food aid has not made a significant contribution towards stabilisation of food security in sub-Saharan Africa. The percentage of the malnourished is still on the increase.

   (4) Certainly we do need external assistance to improve our agriculture and food production. However, the international community can play a bigger role in alleviating food insecurity by channelling their assistance towards direct production.

   (5) Domestic policies should aim at increasing production first. This would need an improvement in four basic areas:
      (a) rural infrastructural supportive services;
      (b) agricultural marketing incentives;
      (c) agricultural technical services;
      (d) resource deployment, especially investment allocation for direct food production and an increase of productivity (yields per person and per hectare).

   (6) Stepping-up the overall socio-economic development is the only sure way of resolving the problem of food insecurity in Africa.

DISCUSSION OPENING – S.D. SAWANT

On the Eicher and Staatz paper

This paper covers a wide canvas of short-run and long-run measures to be adopted to deal with food insecurity arising from lack of effective purchasing power on the part of the poor. Two case studies, namely of Senegal and Zimbabwe, are briefly discussed to bring out the contrasts in policies followed and their consequent impact. In this context the authors have very rightly emphasised the vital importance of development of an indigenous science community and a decentralised research system for evolving locally adaptive technology for agriculture. Preference for a strategy of self-reliance, rather than an insistence on self-sufficiency in food by totally disregarding the relative costs of production of foodgrains *vis-à-vis* non-foodgrains, is also well placed. But there are some serious discrepancies in the authors' remarks about Zimbabwe. It was initially stated that, 'the fundamental problems in agriculture were the low productivity of smallholders, widespread poverty among rural workers on large commercial farms, a large landless population and a rural infrastructure that had been battered during the warfare of the 1970s'. On the other hand we were further told that a substantial increase of 28.5 per cent in the price of maize, a major food staple, elimination of the food subsidy offered on wheat bread and substantially reduced consumer subsidies on meat, dairy products etc. induced favourable growth in agricultural exports. The disastrous consequences of this latter package of increased prices of major food staples and reduced subsidies on other foods to numerous small farmers and particularly to the large landless population, hardly need to be stressed. While not denying the fact that the backlog of indigenously evolved, proven, on-shelf maize technology for both commercial and small farmers is a very laudable achievement of Zimbabwe, it is difficult to accept the authors' judgement that Zimbabwe represents a successful policy model for African countries, when we have not been informed about the consequences of increased food prices for poverty stricken rural workers and the large landless population in the rural areas. Notwithstanding the above discrepancies, however, the general agenda of research to be undertaken for African countries, stated by the authors towards the end of the paper, is very extensive and instructive.

On the Diakosavvas and Kirkpatrick paper

The concept of food security as defined by the authors with reference to aggregate availability has limited relevance to the major problem of 'entitlement failure', either temporary or chronic, faced by a large majority of the undernourished population in the LDCs. This is not to indicate that the authors are not aware of this limitation but to bring out the limited usefulness of the study for a more

vital problem of food security to the poor, especially the rural poor, in developing economies. Secondly, an approximation of food availability by availability of cereals is not a very satisfactory approximation, particularly for quite a few African countries in which non-cereals, such as root crops, pulses, nuts, oilseeds, plantains etc., play an important role in food consumption.

I shall now make a few remarks about the crucial issues suggested below for discussion. So long as the concept of food security is restricted to the supply side, and that too with a short-run time horizon in sight, the solutions are not very complicated, though they may be expensive, owing to difficulties arising from the balance of payments situation. However, partial reliance on national food stocks, supported by the programmes of international co-operation may provide substantial relief in this case. If an objective is to attain target levels of food consumption per caput and thereby increasingly improve the status of nutrition for all in the community in the long run, we need to concentrate on growth of agricultural production or more specifically food production, if food self-sufficiency is not a relatively high cost strategy compared to a broader goal of self-reliance. However, availability of food does not necessarily guarantee physical and economic access of the poor to food. But extension of the food security concept to cover the demand aspect takes us to a much wider canvas of strategies which aim at (i) building up an efficient food distribution system supported by adequate infrastructural development particularly in the rural areas and (ii) generation of 'food entitlement' to the rural poor in LDCs. Obviously, we assume in this context that adequate food availability and increased real incomes (to ensure food entitlement) of the poor would push up their level of food consumption and consequently their nutritional status and thereby increasingly reduce their vulnerability, both to food supply variations and real income variations. An important question that crops up in this context is: do the consumption behaviours of the poor justify such a strategy without any reservations? The evidence emerging from Indian data does indicate (i) a preference for 'taste' rather than 'nutrition' of the undernourished at various income levels[1] and (ii) that diversion of income for non-food commodities and services begins at an income level much below the poverty line income.[2] In other words, there is a reason to believe that a mere increase in real incomes may not lead to improved food security to the poor in LDCs unless conscious efforts are made to modify their preference systems and life styles associated with chronic poverty so as to motivate them to increase their food consumption and also acquire adequate levels of nutrition with increased incomes.

NOTES

[1]C.H. Shah, *Demand for Higher Status Food and Nutrition in Rural India: Experience of Matar Taluka*, Bellagio Workshop (Italy), March 1985.

[2]Rao, V.M. and Vivekananda, M., 'Food Problems and Policy Priorities' in Shah, C.H. and Vakil, C.N. (eds.), *Agricultural Development of India: Problems and Policies*, Orient Longman, New Delhi, 1979.

GENERAL DISCUSSION – RAPPORTEUR: CARLISLE A. PEMBERTON

The discussion on the first paper centred on two major issues. First, whether increased export or cash crop production (for example, cotton production in the Sahel) could be valid policy for the alleviation of the food security crisis in sub-Saharan Africa and second, an appropriate definition of the concept of food security.

Dr Staatz noted that the paper considered two time perspectives: while increased cash crop production may not increase food availability in the short run, in the longer term it provides a source of revenue for improving rural infrastructure and it also allows, through income generation, great access of the poor to food via the market mechanism. He conceded however that most countries must produce the majority of their own food with only residual amounts being met by food imports, financed perhaps by the sale of cash commodities. In this context he accepted the criticism of a neglect in the paper of the contribution of livestock to food production in sub-Saharan Africa.

On the definition of food security, discussants expressed some concern with the one provided in the paper, especially since 140 countries had accepted a clear definition of food security at a recent FAO meeting.

Another issue discussed was the informal food sector, where it was noted that so-called 'street foods' may represent some 20–25 per cent of the food budgets of poor households, but that such food consumption may be neglected in more macro-oriented studies or studies concentrating solely on foods eaten within the home.

In reply to the discussion opener, Dr Staatz stated that there was no simple or single cause of the loss of ability of sub-Saharan African countries to feed themselves. To the list of causes noted in the paper and expanded upon by the opener, another cause could be added 'unfavourable weather'. He agreed that Zimbabwe might not be quite the success story that was presented in the paper distributed to the Conference and stated that a revised paper would deal with some of the difficulties of the Zimbabwean experience.

The discussion of the second paper centred on the points raised by the discussion openers: the use of cereals to represent food (in the paper) and the increase in food imports with increase in foreign exchange in developing countries.

Dr Diakosavvas stated that cereals were used as a proxy for food since, as noted in the paper, for most developing countries the share of cereals in total food consumption as well as the share of human consumption in total cereal consumption were both high. Also, he noted that there was

general unavailability of data on non-cereal food consumption in developing countries.

On the second issue, Dr Diakosavvas argued that food imports increase as foreign exchange reserves increase in developing countries because food imports 'crowd out' non-food imports in the use of foreign exchange. The need for food imports arises from shortfalls in domestic food production perhaps caused by changes in consumer tastes as a consequence of rising incomes. Fluctuations in foreign exchange reserves could then result in a short-term food insecurity problem.

The need for an adequate definition of food security was raised in the discussions and Dr. Diakosavvas noted that he was aware of and accepted the definition agreed to at a recent FAO meeting. He therefore had not offered any alternative definition in his paper.

Participants in the discussion included J. Berthelot, R.C. Agrawal, F.S. Idachaba, M. Vanegas, E. Iveri and I. Tinker.