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FOOD SECURITY OPTIONS FOR
SUB-SAHARAN AFRICA

By

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FOOD SECURITY OPTIONS FOR
SUB-SAHARAN AFRICA

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ABSTRACT

The food situation in Sub-Saharan Africa is an issue of growing concern. It is the contention of the paper that the primary issue is not overall supplies of food, but access to existing stocks of food and access to the means of production to produce food. Sen's concept of food entitlement is used as a means of analysing the food situation from the perspective of access to food. In the first section, the content of Sen's food entitlement approach is outlined. In the subsequent sections, various proposals for food security, both at the international and national levels, are outlined briefly and evaluated on the basis of the food entitlement approach. The paper concludes with a brief discussion of the policy options designed to improve food entitlement systems.

Food Security Options for Sub-Saharan Africa

We have been told repeatedly that this is a world-wide struggle between the forces of evil and the forces of decency ... We all know that we are engaged in the struggle of men's minds, for their loyalties ... If it is a world-wide struggle, it would seem to me we would want to mobilize all the resources we possibly can in order to win it. And in a world of want and hunger what is more powerful than food and fibre?

(Hubert Humphrey, 1959)

Every person has a fundamental and unconditional human right to food. Furthermore, every nation has the right to self-determination and self-reliance, and under no circumstances should food supplies be used to control or limit that right.

(World Council of Churches, 1983)

For 1984/85, 21 countries in Africa have been identified as having "exceptional food supply problems" (Food and Agriculture Organization, 1984: 4). On the basis of a food balance sheet approach, these countries are seen to have a growing gap between their production of cereals and their respective demands for cereals.

An alternative approach, using international trade statistics, identifies Sub-Saharan Africa as a net exporter of food (excluding food aid) (World Food Council, 1983: 6). Five of the 21 countries with a food supply problem are located in eastern Africa. In 1980, these five countries had net exports of 'food and beverages' (again excluding food aid), of US\$ 903 million (Rempel, 1985: Table 6). This level of net exports of 'food and beverages' has increased by US\$ 356 million from 1970. One of these five countries, Ethiopia, has been identified as having cereal requirements in 1985 in excess of its logistical capacity to import food (Food and Agriculture Organization, 1984: 5), yet is reported to be exporting grain (Daily Nation, Jan. 15, 1985: 9).

These international trade results indicate one of the weaknesses inherent to the macro-level, food balance sheet approach to identifying food needs. That approach focusses on a sub-set of food, primarily those cereals in excess supply in North America. The analysis seeks to relate those surplus supplies of cereals to a perceived growing inability in various African countries to feed their respective populations.

The existence of hunger and starvation in parts of contemporary Africa cannot be denied. But, these conditions of hunger are not the same as the chronic malnutrition associated with poverty in developed countries.

Rather, in Sub-Saharan Africa hunger and starvation are specific, periodic phenomena, affecting only a sub-set of the respective populations. For some it is a seasonal occurrence, inadequate supplies of food to tide them over to the next harvest. For others it is the periodic effect of erratic, unpredictable rainfall. For the majority it is the deprivation associated with various forms of armed conflict.* Their situation is aggravated by the willingness of governments of various persuasions -- from the Mengistu regime in Ethiopia to the Reagan administration in the United States -- to use food as a political weapon.

For those experiencing hunger in Africa, the 1984 world record cereal crop is a mere mirage; for them food security is little more than a dream. They are denied one of the fundamental human rights, access to an adequate supply of food.

Analysis of improved food security in African countries must address these situations where sub-sets of the respective populations are denied access to the available stocks of food and/or are denied access to the resources needed to produce food. Sen's concept of food entitlement is seen as a means of analysing food security on the basis of access to food. The purpose of this paper is to use his concept of food entitlement to evaluate the various policy options -- at the international, national and local levels -- that have been proposed as a means to greater food security in Africa.

1. Food Entitlements and Food Security.

Food security is the assurance of reliable supplies of adequate nutrition for all the people. Food entitlement, as developed by Amartya Sen (1977; 1981a; 1981b), defines the relationships of various classes of people to such supplies of nutrition.

For the purpose of analysis, Sen divides entitlement relationships into four types:

- (1) trade based entitlement: one is entitled to own what one obtains by trading something one owns with a willing party (or, multilaterally, with a willing set of parties);

* "In 1981 man-made disasters accounted for 75% of the emergency food aid channelled through the UN/FAO World Food Program. It went to Afghan refugees in Pakistan, Kampuchean refugees in Thailand, and displaced persons in the Somalia - Eritrea disturbances." (Lewis, 1982: footnote 8).

- (2) production-based entitlement: one is entitled to own what one gets by arranging production using one's owned resources, or resources hired from willing parties meeting the agreed conditions of trade;
- (3) own-labour entitlement: one is entitled to one's own labour power, and thus to the trade-based and production-based entitlements related to one's labour power;
- (4) inheritance and transfer entitlement: one is entitled to own what is willingly given to one by another who legitimately owns it, possibly to take affect after the latter's death (if so specified by him).

(Sen, 1981b: 2)

Food security is reduced whenever one or more of these entitlements are eroded. Direct entitlements are eroded when a household can no longer produce an adequate supply of food to meet the nutritional needs of the household members. Trade entitlements are eroded when either the household factor endowment is reduced, household labour is unemployed or becomes incapacitated, or the household is faced with an adverse shift in its terms of trade (Sen, 1980: 617).

A sudden reduction in food supply in a particular locale, the traditional explanation for famines, may be associated with an erosion or collapse of food entitlements, but is not a necessary condition for reduced food entitlements. Indeed, a sudden decline in food availability can be seen as a special case, which is adequately encompassed by the more general food entitlement concept. In contrast to the food availability decline thesis, the more general concept can encompass the situations where food is being exported from the famine region -- Ireland during the famine of the 1840's; from the district of Wollo to Addis Ababa and Asmara during the Ethiopian famine of 1973; and from the famine affected districts of Bangladesh during the 1974 famine (Sen, 1981b: 161) -- and the famines that occurred even though the shops in the famine areas were reported to be well stocked with a variety of foods -- the Bengal famine of 1943 and Ireland in 1846 (Sen, 1980: 616 - 618).

Similarly, the food entitlement approach to food security can encompass the thesis which attributes chronic malnutrition to poverty rather than food shortages (e.g., Reutlinger, 1977). The poverty thesis is applicable to developed countries, where those living in poverty are systematically denied sufficient food entitlements to enable adequate nutrition. Changing the existing entitlement system, to eliminate such chronic malnutrition, is viewed by the majority as too costly, so attempts are made to address the chronic malnutrition associated with poverty through the use of non-entitlement transfers of food and/or income to that sub-set of the population living in

abject poverty.

The countries of Africa are considered to be relatively poor, but the existing food entitlement systems in African countries generally do not condemn a sub-set of the people to chronic malnutrition. The problem may be emerging, as low income consumers in Africa are forced to compete with high income consumers in developed countries for use of land in African countries (Rempel, 1983: 4 - 6). In the current situation, though, the primary problem is still one of the periodic erosion, for some classes of people, of existing food entitlements. When such food entitlements collapse, the classes of people affected are subjected to famine conditions.

Sen identifies a variety of ways in which the erosion of food entitlements may be expressed. For those with the means to do so, the anticipation of food shortages and/or food price increases causes them to hoard staple foods. This was evident in the 1942-43 Bengal famine (Sen, 1981b: 76) -- or because there has been a temporary, local decline in food availability, as occurred in areas flooded in Bangladesh in 1974 (Sen, 1981b: 131 - 132). Food price increases need not occur if the erosion of food entitlement destroys a quantity of demand for food equal to or greater than the supply shortfalls of food in the market. Sen argues this is what occurred in Wollo District, Ethiopia in 1973 (Sen, 1980: 618).

If food prices increase significantly, a second round expression of food entitlement erosion is a decline in real income for those people who lack the power to protect themselves against inflation. This occurred in both the 1942-43 Bengal famine and the 1974 Bangladesh famine (Sen, 1981b: 146 - 147). With a decline in real income, the demand for some non-food items will decline, causing unemployment. Also, the producers of specialised forms of food, e.g., fish, milk, meat, may well be affected adversely.

Finally, as reported earlier in this paper, the loss of food entitlements in a particular locale may cause available food in the area to move out to those markets where consumers still have the ability to pay.

The effects of these expressions of food entitlement erosion can be seen to fall on identifiable classes of people.* The most vulnerable

* The list of classes of people identified as most vulnerable to food insecurity is essentially the same as the target groups identified in Kenya's 1984-1988 Development Plan as afflicted with poverty and requiring specific action: pastoralists, small farmers, landless rural workers, urban poor and the handicapped (Republic of Kenya, 1983a: 56).

group, under conditions of natural disasters or declining relative prices for agricultural output, are farm labourers, including farm servants. This was shown in the 1942-43 Bengal famine (Sen, 1981b: 141), and in the 1973-74 Ethiopian famine (Sen, 1981b: 99 - 100). Their own-labour entitlements were seriously eroded, destroying their trade entitlements. This occurred in Bengal even though a record rice crop was produced there in 1943.

Natural disasters, such as droughts and floods, also erode the production entitlements of the peasant farmers, including tenant farmers and share-croppers. Both Ghose (1982: 372) and Wolde-Mariam (1984: 515) stress the vulnerability to drought of those peasant farmers who have little or no involvement in a monetised exchange economy. Tenant farmers and small, land-owning cultivators are identified explicitly by Sen (1981b: 99 - 100) as victims of the 1973-74 drought in Ethiopia. In the Bangladesh flood, farmers were the second largest class adversely affected (Sen, 1981b: 141). In Kenya, preliminary results from a survey in six districts show a collapse in on-farm production income in 1984-85 in the agricultural zones less well suited to such cash crops as tea and coffee (National Environment Secretariat, 1985a: Tables 1 and 2).

Pastoralists are also an identifiable class particularly vulnerable to drought. They lose both production entitlement, as their livestock dies, and exchange entitlements. The latter occurs for two reasons: 1) meat is a 'superior' good in the diets of the vast majority in low income countries so consumption of meat declines as entitlements are eroded; and 2) the volume of livestock sales increases as pastoralists seek to obtain supplementary food, causing the price of livestock to fall. These effects on the pastoralists have been especially evident in Ethiopia (Sen, 1981b: 99 - 100; Wolde-Mariam, 1984: 516; Cutler and Stephenson, 1984: 5).

In contrast, if the loss of food entitlements are caused by increased food prices, peasant farmers may benefit. This was the case for rice producers in Bengal in 1943-44 (Sen, 1981b: 69 - 70). Similarly, share-croppers may be able to retain their production entitlements if they receive a fixed share of the farm output. The farmers affected adversely by food price increases are those that have access to an insufficient quantity of productive land to enable them to produce enough food for their respective households. Their vulnerability was noted by Sen (1981b: 142 - 145) during the period of price inflation following the 1974 flood in Bangladesh.

Finally, during periods of food price increases and/or general economic decline the exchange entitlements of non-agricultural labour and the providers of services are eroded. In these two classes Sen identifies transporters in the 1942-43 Bengal famine (Sen, 1981a: 446 - 447), and daily male labourers, women in service occupations, and craftsmen in the 1973-74 famine in Ethiopia (Sen, 1981b: 99 - 100).

Several policy implications can be drawn from these particular effects on identifiable classes of people. First, the process of development need not assure that the problem of food insecurity within certain classes of people will diminish. Ghose argues: "Ceteris paribus, the possibility of a famine occurring increases as a peasant economy evolves into a non-monetised exchange economy, and as the latter evolves into a monetised exchange economy." (1982: 373). Similarly, Reutlinger (1977) is not confident that the problem of malnutrition will gradually disappear as development occurs. Taylor claims there are no short run solutions to the food problem. Rather, what will be required is "some sort of income redistribution, through land reform, through disguised transfers via food or medical programmes ... or through Revolution." (1975: 837).

Second, augmenting a country's food supply through food aid need not serve as either a necessary or sufficient condition for solving a particular situation of hunger and starvation. International food aid can serve as a creative, short-run means of offsetting a significant decline in food availability and as a means of countering hoarding, especially for speculative purposes. Merely increasing the food supply is not enough in situations where exchange entitlements have collapsed. The food must be brought to the classes of people adversely affected and must be distributed as charity or its purchase must be facilitated, e.g., with a food-for-work program.*

Third, the free market may well aggravate a famine situation rather than serve to alleviate it. According to Sen: "Market demands are not reflections of biological needs or psychological desires, but choices based on exchange entitlement relations. If one doesn't have much to exchange, one can't demand very much, and may thus lose out in competition with others whose

* A creative effort in this regard is reported by Cutler and Stephenson (1984: 25 - 26). The non-governmental organization Redd Barna bought grain at lower prices outside the famine area in Ethiopia and transported the grain to the famine area and sold it at cost. They attempted to facilitate the ability of the pastoralists to buy the grain by offering to buy the local livestock at the higher prices prevailing outside the famine area and then transporting the livestock to the markets where such prices were evident. This part of the program failed as they were denied permission to move livestock out of the famine area.

needs may be a good deal less acute but whose entitlements are stronger." (1981b: 161 - 162). He goes on to cite Koopmans to the effect that economic theory assumes each consumer can survive on the basis of the resources she/he holds plus have enough labour to spare which will meet a positive price at equilibrium in the market (Sen, 1981a: 436). That is, economic theory, as it relates to market behaviour, eliminates the malnourished sub-set via assumption. Food security policy must recognize that the hungry and malnourished have become disenfranchised in an economic sense.

The operation of a free market for food need not be foreclosed in that hunger and starvation in African countries tends to be periodic, temporary phenomena. Rather, as Rashid (1980) argues, temporary scarcities with reference to staple foods constitutes an exception to Adam Smith's general principles on the free market. Specifically, he identifies two situations where a free market could cause increased scarcity in the short term: farmers withhold some staple cereals from the market in the expectations of higher prices in the future and traders hold staple food off the market for speculative purposes. To these two could be added a third, hoarding by those consumers with the ability to make larger purchases. Even if traders do not engage in speculation, collapsed food entitlements within some classes in a locale does not provide any incentive for traders to bring food from other areas in the country.

According to Rashid, Adam Smith dismissed such harmful effects on the basis of a strong belief in competition. Adam Smith's position was used as an argument against prohibiting "forestalling" in Britain during the food scarcities in 1795-96 and 1800-01. Rashid takes a counter position: "the competitive market does not worry directly about feeding mouths. If the labourer has insufficient income at current market prices to buy a subsistence bundle, the laws of the market doom him to starvation." (1980: 498). Rashid also notes the political nature of the use of Smith's theory as a means of opposing the corn laws in Britain. A similar critique was not made of government restrictions on distillers and bakers.

Fourth, the elimination of hunger and starvation need not require significant increases in food availability per capita. Sen (1981b: 7) cites the case of China, where starvation has been eliminated via changes in the

food entitlement system without a large increase in food available per capita. During the early part of the Sahel famine, 1968 to 1972, the per capita supply of cereals exceeded the quantity needed to meet the FAO/WHO recommended food intake per person (Sen, 1981b: 118). By 1975, only Mauritania was not producing sufficient grain to feed its population. Had the available cereals been divided equally among the population, the Sahel famine need not have occurred.

As a conclusion to this section, the applicability of the concept of food entitlement, including the policy implications, to the current situation of food insecurity in African countries is outlined briefly. One cause of food insecurity in Africa is the significant land areas subject to variable, unreliable rainfall. Whenever the rains fail, the food entitlements of the pastoralists, peasant farmers and farm labourers decline temporarily.

A second reason for food insecurity is the gradual undermining and replacement of the existing traditional food entitlement systems. This is especially evident among nomadic pastoralists, who have lost much of their dry season grazing reserves to farmers and to game reserves (Campbell, 1981; Gunn, 1984). This has made their livestock, and hence the pastoralists, more vulnerable to drought.

Another class that has become more vulnerable to drought is the peasant farmers moving on to vacant but marginal agricultural land. A combination of factors -- population increase, increased use of better land for export crop production, and limited employment opportunities outside of agriculture -- are forcing more and more people to seek a livelihood on such marginal farm land. Partly because of the drier conditions, and partly because the farmers continue to attempt to grow their traditional crops, better suited to higher, more regular rainfall conditions, these farmers experience periodic crop failures and hence loss of direct food entitlements.

The persistence of armed conflict in various parts of Africa is destroying existing food entitlements in the areas under dispute. In the short term, such armed conflict creates refugees; people who have lost their traditional entitlements. On a longer term basis, such armed conflict is destructive to the environment which, in turn, increases the likelihood of drought.

Finally, for small peasant farmers the increasing cash requirements for taxes, school fees, etc., necessitates selling food at harvest time. With

a relatively inefficient food distribution system in many African countries, this increases vulnerability at the local level as farmers pay considerably more for the food they purchase than the price they received at harvest time. Also, the more remote areas cannot count on food being available when local food needs are most pressing.

A third reason for increased food insecurity is the evolution of new entitlement systems in the various parts of Africa which tend to leave some classes of people in an increasingly vulnerable position. We would hypothesize that the likelihood of malnutrition (both the numbers of people involved and the degree of malnutrition) will vary directly with the degree of dependence of a country on agricultural exports as a source of foreign exchange and with the extent of openness of a country to Western consumerism, hence external taste preferences.

There are several reasons for this hypothesis. First, average labour productivity outside of agriculture has remained approximately 4.5 times above the average labour productivity in agriculture during the period 1960 to 1977 (Rempel, 1983: Table 5). This means a low productivity majority has had to devote more and more resources to generate a growing quantity of foreign exchange required to provide for the changing taste preferences of the relatively high productivity minority. Imported food, primarily wheat and rice, are included in these changing taste preferences. Domestic food production had to suffer in the process: the sectors with high labour productivity did not generate comparable growth in demand for local food and some resources previously used for food crops now are being used to produce export crops. Second, most of Africa's agricultural exports cannot be used as a ready source of nutrition. As a result, the peasant farmers producing export crops cannot consume their output in times of drought or when farm output prices decline. This makes such farmers less secure with reference to own-household food availability. Third, world prices, including changes in foreign exchange rates, begin to dominate over domestic supply and demand forces. For the people so affected, price variations, over which they have no control, introduces another cause of vulnerability.

Associated with the increased demand for agricultural output, both for export and domestic purposes, is the emergence of a market for land. As a result, landlessness is becoming a growing problem (Lofchie, 1980: 6 - 7; Rempel, 1981: 172). Africa has more than half of the arable land still idle

in the world (Eicher, 1982: 153), but the landless, the unemployed and the marginally employed either do not have direct access to that idle land or they lack the resources to make such land productive. Therefore, increasing numbers being denied access to land is another form of entitlement erosion.

The primary alternative is wage employment. But, the extent of dualism in most African economies has limited the capacity to absorb the available supplies of labour into secure, productive employment. With insecure employment and with a limited ability to protect themselves against inflation, those fortunate enough to obtain formal sector employment still remain quite vulnerable. Their exchange entitlements may be eroded or caused to collapse by forces over which they have little or no control. Nonetheless, they tend to be less vulnerable than the growing reserve armies of unemployed and marginally employed in Africa.

2. Proposed International Approaches to Food Security

Proposals to co-ordinate international markets for cereals date back to at least the origins of the Food and Agriculture Organization. The 1974 World Food Conference in Rome, meeting under the pressures generated by the 1972-74 food crisis, gave new impetus to proposals for an international means to food security. Specifically, the participants at the Conference agreed that some form of food security system was required. Several food security proposals spawned by this decision at the 1974 World Food Conference are examined briefly here.

When viewed from an international level, food security involves two distinct but related elements. One element is variability in food availability within a country, caused either by natural or human forces. The second element is variations in the prices of food traded internationally. The first element can be stabilized provided a country has the foreign exchange to import food whenever food availability decline occurs. An in-country shortfall in food, combined with high world prices for food, can place a country in severe difficulties. Where foreign exchange is earned via agricultural exports, the two elements become linked as natural or human forces that reduce food production will also reduce the ability to grow export crops. A comprehensive food security program would need to address both elements of food insecurity.

One approach to international food security involves holding an international grain reserve. Aziz (1977) argues that the 1972-74 crisis in internationally traded cereals has caused the major grain trading partners to sign longer term contracts. This will mean increased instability for low income countries as variations in the production of food will need to be absorbed by a smaller sub-set of the internationally traded grain. An international grain reserve is identified by Aziz as the means to reducing such instability in the food available to low income countries.

Johnson (1976) outlines a mechanism for implementing such an international grain reserve. He proposes calculating a long term food production trend line for each country. Whenever a country has a food shortfall in excess of six per cent of the long-term trend line, it could draw on this international grain reserve. Low income countries would receive the grain as food aid; middle income countries would pay at least part of the cost of the food. Such payments would be in the form of insurance premiums. The six per cent variation is intended to provide an incentive for low and middle income countries to hold sufficient food reserves to meet up to a six per cent shortfall in food supply in any one year. Also, a six per cent trigger minimizes the impact of some large South and Southeast Asian countries such as India and Indonesia. They tend to have relatively minor percentage shifts in food availability, but a small shift can quickly absorb the available international food aid. Johnson calls on the United States to implement such a program unilaterally. The costs were projected to be less than the cost of the United States' food aid program at the time.

Sarris and Taylor (1976) propose a more complex, three part, international grain reserve system. The first element involves an annual commitment, by high income donor countries, of 50,000 tons of food. This committed food would be held by the donor countries, but could be drawn down, at short notice, by such relief agencies as the World Food Program to meet any national emergencies. A second element would involve a store of 10 million tons of food aid, to be made available at concessional terms, to assist the most severely affected countries whenever they experience a shortfall. Such aid is premised on the observation that in low income countries, whenever production shortfalls occur, the agricultural exports of these countries tend to fall as well. Hence their capacity to import food is eroded along with their capacity to produce food. A third element of their proposed program is a buffer stock of food, operated as an insurance scheme, where grain would be stored

whenever grain prices fall below a certain level and accumulated stocks would be placed on the market whenever grain prices exceeded a certain level.

An alternative approach to international food security focuses solely on the foreign exchange constraint element of food insecurity. Instead of an international grain reserve, such a scheme would establish foreign exchange facilities to cover the cost of cereal import bills in excess of some percentage of a trend import bill. When applicable, such foreign exchange reserves could be borrowed (Siamwalla and Valdes, 1980), or the low income countries could receive compensation from such foreign exchange reserves (Kondreas, et. al., 1978).

Kondreas, et. al. (1978) carry out a cost-benefit comparison of such a foreign exchange compensatory scheme and a scheme involving a combination of foreign exchange compensation with a relatively small, 20 million ton, buffer reserve of wheat. They conclude that it is not possible to choose among the two programs solely on the basis of relative costs. The latter program has the cost of storing wheat, but the existence of such a buffer stock reduces the likelihood of high compensations being incurred. Hence they favour the combined foreign exchange compensation and wheat buffer stock program as this would have a higher probability of meeting the objectives of a food security program.

A third approach to international food security has one common element: opposition to an international grain reserve or buffer stocks. This line of reasoning has a great deal of faith in the efficacy of the free market as the means to food security.

The arguments presented against an international grain reserve are: 1) the existence of a grain reserve depresses world grain prices, reducing world production below what it would be without a reserve (Weckstein, 1977); 2) holding an international grain reserve discourages private speculators from holding grain (Weckstein, 1977). Implicit here is the belief that private storage of grain costs less than public storage of grain (Josling, 1977); 3) if grain prices are free to fluctuate, more food will become available when prices are high as people will consume less (Josling, 1977), and less grain will be fed to livestock (Johnson, 1977; Lewis, 1982: 18); and 4) resolving the food problem is essentially a technological issue: technology to improve production, storage, processing and fortification of food (Harmon, 1979; Johnson, 1977). Transnational corporations are seen to be the key agents to develop

such technology, transfer it internationally, and make it commercially viable.

From the perspective of food security during the short-term, the free market proposal is the easiest to critique. Where this line of reasoning may have some relevance to increasing food supplies in the long-run, it ignores totally the primary role of food entitlement erosion (or collapse) as the cause of hunger and starvation. It is the poor, not the rich, who reduce consumption of food when food prices rise. The limited role of the free market as a means of eradicating hunger is illustrated with the International Institute for Applied Systems Analysis (IIASA) model for their Food and Agriculture Program. They simulated the effect of injecting an additional 30 million tons of wheat into the world market. The results obtained indicate: "Almost none of it reached the hungry people of the countries represented.... The countries ... increased their buffer stocks, they changed their export structures and they substituted their wheat production with feed grain, bovine, dairy and non-food production. Consequently hunger was not eradicated; instead a new export and production structure was created that seemed more profitable from the point of view of new relative prices." (Rabar, 1981: 69).

The IIASA simulation highlights one of the problems inherent to all international security proposals: they are based on surplus cereals available, mostly wheat, and located primarily in North America. The staple foods of the vulnerable, low income classes in Africa is coarse grains, not wheat or rice.

Cereal imports have been increasing rapidly in Africa. These imports, including food aid, have been dominated by wheat, which accounts for 47 per cent of the total in 1978-80 (Shah, et. al., 1984: Table 2.8). Rice accounted for 24 per cent while coarse grains (maize, sorghum, millet and barley) were 28 per cent. The reason for these imports is the increase in per capita consumption of wheat from 8 kg. in 1966-68 to 12 kg. in 1978-80 (Shah, et. al., 1984, Table 2.2). Rice consumption also increased from 11 kg. to 14 kg. per capita, while per capita consumption of coarse grains declined from 93 kg. to 83 kg. These consumption changes indicate the pervasive switch among the relatively wealthy minority in Africa from coarse grains to wheat and rice.

The international food security proposals primarily relate to such changes in consumption patterns. The poor may derive some benefits from such international transfers. First, the overall supply of food in the receiving country increases. Second, less pressure is placed on agriculture to produce foreign exchange to purchase wheat and rice on the international market. On

the other hand, the increased supply of wheat and rice can depress prices paid to local producers, hence reducing their exchange entitlements.

The effective implementation of an international grain reserve and/or a foreign exchange compensation scheme can, potentially, contribute to greater food security in Africa. First, it would increase the overall food supply available to a country, whenever it experiences a temporary short-fall in food production, without impairing the country's foreign exchange reserves. Whether such a program of food/foreign exchange aid would benefit those with reduced food entitlements will depend on the willingness and the ability of the government in that country to assist those in need.

In addition, such an international approach to food security would reduce the onerous political ties now associated with food aid. Indeed, giving up the right to use food aid as a political weapon is a cost of implementing an international food security system which is not really considered by the authors cited above. The evaluation by the United States General Accounting Office (1983) of the (in)effectiveness of United States' food aid as a means of inducing policy changes in Africa indicates the United States policy, as enunciated by Hubert Humphrey in the opening quote of this paper, is still very much alive.

Food aid is also used to dispose of surplus agricultural production and as a means of promoting additional sales of agricultural commodities. These two functions of food aid would also be reduced if an effective international grain reserve was established. Along with Fryer (1981), we have little confidence that the countries holding the bulk of the surplus cereals will be prepared to give up these dimensions of contemporary food aid.

In conclusion, it should be noted that one aspect of the Sarris-Taylor proposal, an emergency source of food aid, with a guaranteed minimum of 7.6 million metric tons, now exists (Lewis, 1982: 19). Also, the International Monetary Fund has some provision for increased borrowing to meet balance of payments problems caused by unusually high food import needs (Awiti, 1982: 15 - 16; Lewis, 1982: 19). The other, more substantive, aspects of the international food security proposals are unlikely to be implemented, given the opposition of the major grain trading companies, the lack of agreement on who would bear the costs involved, and the need for food donor countries to give up the political leverage now associated with food aid. Aziz (1977) likely is correct that an international approach to food security has a better chance of being implemented if organized at a regional level.

3. National Approaches to Increased Food Security

Where ultimate responsibility for food security should be located appears to be open to some debate. As noted in the previous section, an international food security program can supplement national efforts. But accepted conventions on national integrity would prevent international agencies from being responsible for food security of a people in a particular locale within a country.

Responsibility for food security could be decentralized to a local or even household level. Whether this is practical or desirable requires further study. Development, historically, has been associated with increased specialization. We would hypothesize that households being required to shoulder full responsibility for their personal food security would conflict with increased specialization, limiting land and labour productivity increases, and hence retarding overall development.

Siamwalla and Valdes (1980) locate responsibility for food security at the national level. The reason is a practical one, national governments are better placed than other units within society to borrow internationally and to arrange for food imports whenever food shortfalls occur.

Lappe and Collins (1977) locate responsibility for food self-sufficiency at the national level. Their thesis recognizes the vast international power differences in today's world, and they argue dependence on external sources for the staples of life will result in a dependency relationship. They see dependent people as incapable of achieving development. According to their thesis, the eventual solution to the world food problem will come from hungry people solving it themselves. Such people will accomplish if they have access to the needed productive resources, such as land, and they are set free psychologically from relying on others to decide what is to be done. Therefore, national self-sufficiency in food staples is seen as a necessary pre-condition for both "constructive interdependence" with other countries and national development.

Logically, one would expect an entitlement approach also would place primary responsibility for food security at the national level. National governments play the major role in both defining and enforcing entitlement systems. Therefore, national governments should shoulder responsibility for both the evolution of entitlement systems, to assure access to food for all, and for appropriate action whenever existing food entitlements fail.

Carrying out this responsibility will not be easy. In addition to inherent political conflict in any action that affects distribution within society, there likely are distinct trade-offs between assuring short-term food security and promoting longer-term increases in the production of food. A joint study by the FAO, UNFPA and IIASA (Harrison, *et. al.*, 1984), has documented the need for African countries to move from "low" level of input use to an "intermediate" or "high" level if they are to be able to continue to provide food for their growing populations. This will involve more optimal crop mixes, increased use of fertilizer, organic recycling and biological fixation of nitrogen, as well as the use of improved seeds, pesticides and conservation measures. In promoting such changes, Griffin's caution with reference to technology is applicable: "... an old system of agriculture, slowly or swiftly, is in the process of being destroyed by the advance of contemporary technology. This technology contains a positive potential for economic and social development. But if used unwisely, it can aggravate tendencies already discernible and contribute to further inequality and poverty." (1974: xiv).

With this proviso in mind, several national approaches to food security are evaluated on the basis of the concept of food entitlement. First, several food supply proposals, which seek to address food availability decline, are outlined and evaluated. Then we turn to approaches taken in the situations where the effective demand of the people is inadequate to assure sufficient nutrition for all household members. We conclude this section with a brief discussion of the attempt by the World Food Council to promote national food strategies.

One approach to assuring adequate supplies of food is strategic reserve of the primary staple food. For example, an effect of the 1979-81 food crisis in Kenya has been the recommendation that Kenya's strategic reserve be increased from 2 million to 4 million bags (each 90 kg.) of maize (Republic of Kenya, 1981: 40). Tanzania has now also established a strategic reserve which according to Bryceson (1982), has reduced the surprise element of grain crises.

Various sources criticise the use of such buffer stocks as a relatively expensive approach to food security. Siamwalla and Valdes (1980: 260) argue the holding of liquid financial assets, to be used to purchase food imports in time of need, costs less than holding stocks of food. With the use of a simulation model, Reutlinger and Knapp (1980: 29) conclude buffer stocks are relatively ineffective and costly when compared to international trade approaches to food security. Lewis (1982: 17) cites cost estimates of holding

buffer stocks of cereals in landlocked African countries of \$150 per ton annually, which he notes is much higher than the \$10 per ton charged by the Canadian Wheat Board to store grain. When all opportunity costs are added in, Lewis argues buffer stocks to assure food security in the Sahel region could be as high as \$500 per ton annually.

The estimates cited by Lewis appear to be an extreme rather than a typical case. Awiti (1982: 18) estimates the cost of holding Kenya's strategic reserve at Kshs 11.50 per bag, which would be less than \$10 per ton annually.

In addition, relying on imported cereals in time of crisis can also involve significant costs. The primary source of internationally traded cereals is the United States, which has been known to exact significant political conditions from individual African countries that find themselves in a food crisis situation. Also, it takes time to mobilise external sources of grain and to move such grain to the people in need, typically located some distance from the national port. In a time of food crisis, involving only a sub-set of the population, the normal transport/port flows, which primarily serve the wants and needs of the majority of the population, need to be subjected to the crisis food needs of a minority. When the food needs affect the densely populated Central Province of Kenya, as well as the high-risk drought regions in Eastern and North-Eastern Provinces, as was the case in 1984-85, then it is politically possible to commandeer the existing transport/port facilities to meet the emergency food needs of the people. Where those suffering food entitlement collapse are marginal minorities, as is the case in Sudan and Ethiopia in 1985, it is not as easy to replace normal transport/port activities. When emergency food needs are in a landlocked country, it is very difficult to commandeer the transport/port facilities of the other countries through which such imported food must pass. The simulations and cost estimates made from a distance do not capture all of these political and economic realities for short-term, locale specific food shortfalls.

It is our contention that the choice is not between total reliance on buffer stocks versus total reliance on imported food as a means to food security. All countries hold some reserves. The relevant question is how large should such strategic reserves be, and what combination of national reserves plus supplemental imports would provide food security at minimum cost. For example, the Royal Tropical Institute (1983: 45) has estimated the cost of holding Kenya's strategic store of 4 million bags of maize could be reduced by

more than 50 per cent if a flexible system was adopted where food imports would be initiated whenever a food shortfall reduced the strategic reserve to 2 million bags, and export of maize would be permitted in years when the strategic store exceeded 5 million bags.

Drawing on food aid as part of a food security strategy is a variation of relying on food imports. The problems listed above, associated with getting food from external sources to the people in need, still apply. The major advantage of food aid to a recipient country is the saving of scarce foreign exchange.

Relying on food aid as a means of food security carries with it specific political implications: 1) the availability of food aid declines as the stock of excess supplies of food on the international market decline, so food aid is least available when needed most; 2) dependence on external sources of food reduces the control of government over the local food situation; 3) to maximize their political leverage, donor countries prefer to wait until malnutrition is openly visible before entertaining the possibility of providing food aid; 4) the receiving country must accept what is offered, which need not meet local taste preferences nor be the preferred form of nutrition; and 5) extensive reliance on food aid can have longer-term adverse effects on food production within the country.

The discussion of food storage and increased supplies of food addresses short-term food insecurity in situations where the cause of the food problem is food availability decline. Even in those cases, increased supplies of food alone will not address the problem if the increased supplies remain inaccessible to those classes that have experienced a food entitlement collapse. Several proposals have been put forward to address this additional problem of providing for the nutritional needs of those with insufficient income to purchase adequate nutrition in the market.

One approach to this problem is some form of intervention designed to provide supplemental food to those in greatest need. The more common programs are a system of food stamps distributed to target groups identified as malnourished, establishing ration shops in localities of greatest need in which certain foods are made available free or at a subsidized price, on-site feeding programs for malnourished children, and food distribution to pregnant

and to lactating women and to children.*

Such programs tend to arise in situations where agencies seek to deal with failures or shortcomings of the existing entitlement system. Changing the entitlement system would be a preferred solution, but supplemented food interventions to the system are justified as an interim measure until a more general solution to the problem is found (Knudsen, 1981). Austin (1980) identifies poverty associated with rapid urbanization in low income countries as a particular problem requiring this form of intervention during a transitional period.

The major advantage of this approach to food insecurity is an overall cost significantly less than if the consumption of staple foods in general are subsidized. Here Reutlinger (1977) makes the case for a food stamp program. Others favour on-site feeding (Selowsky, 1979; Mateus, 1983), because this delivers food to target groups within the sub-set considered to be poor: primarily children. At issue here is a perceived need to interfere in the intra-household distribution of food. Knudsen (1981: 10) argues for quantities of food at on-site feeding programs which are equal to or near the nutritional requirements of the children involved, as they likely will receive less food at home if they receive some food at feeding stations. General distribution of food to high-risk groups -- primarily children, pregnant women and lactating women -- will certainly result in some substitution of food at the household level. Johnston (1977) makes the case for feeding intervention in favour of these three groups particularly vulnerable to the adverse effects of malnutrition, but he also favours combining such food intervention with primary health care and family planning.

A more general approach to a limited ability to buy adequate quantities of food, quite common in African countries, is to subsidize the consumption of staple foods. The intent of such policy has been to promote low-wage industrialization rather than providing greater food security. The primary beneficiaries have been the urban residents, generally at the expense of the rural peasants and pastoralists. A number of authors have criticised this policy on the grounds that it has negative effects on the production of food, and hence has contributed to food insecurity by reducing the overall

* Some specific examples of such programs are provided by Mateus (1983): 1) ration shops located in geographical areas of greatest need (India and Brazil); 2) food-coupon systems made available to the lower income groups (Sri Lanka) or to those groups with relatively low health status (Colombia, Indonesia); 3) a variety of feeding programs in a number of countries. Ahmed (1979) evaluates a food rationing system in Bangladesh; George (1979) and Kumar (1979) analyze the impact of the food rationing system in Kerala State in India; while Gavan and Chandrasekera (1979) look at the food rationing system in Sri Lanka.

supply of food available (e.g., Bates, 1981; Johnston, 1980; Lewis, 1982).

Subsidizing the consumption of a food staple need not be associated with low producer prices. Malaysia and Sri Lanka would be two cases where rice production was promoted by adequate producer prices and/or other forms of assistance to producers (Goldman, 1975; Gavan and Chandrasekera, 1979). Also, the nutritional effect of higher producer prices is not necessarily favourable to all farmers. Mellor (1978: Table 5), using data from India, shows that higher producer prices can have adverse distributional effects as small farmers sold little of their output and had to purchase some of their food.

The case against food subsidies is primarily two factors: the cost is too high as the subsidized food is available to all income groups and the subsidized food has relatively less impact on the remote rural areas, where need may be great but little or no food is purchased on the market. The first criticism can be addressed without necessarily opting for a target-specific feeding intervention. Poleman (1981) argues that Engel's law is less applicable in low income countries as increased income is associated with switches out of 'inferior' foods such as cassava, millet or sorghum, rather than a significant reduction in the proportion of income spent on food. Timmer (1980: 198) applies this to food subsidies by making the case for subsidies on the staple foods of the poor only. In this way the prime target group is served and the overall cost to society is less than if all staple foods are subsidized. Mateus (1983: 13 - 14) indicates this policy has been used successfully in Pakistan, and to a lesser extent in Bangladesh, where low quality wheat consumption was subsidized but not rice, the preferred food of the higher income classes. In Sub-Saharan Africa, the application of such a policy would remove all consumer subsidies from wheat and rice, and, in some cases, from maize as well. Should this create additional demand for 'inferior' grains among the higher income classes, the benefits would likely flow to small farmers located in marginal agricultural areas.

One other form of national food security intervention is the national food strategies being promoted by the World Food Council (Royal Tropical Institute, 1983; World Food Council, 1983 and 1984). A strength of this international intervention is that it places the onus on each African country to define its current food situation and to outline a strategy for

improving the food situation. The role of aid agencies is to provide the food aid and the financial assistance needed to enable a country to implement its own proposed food strategy.

This approach could hold some promise for major shifts in agricultural and food policies in Africa. The intent of the World Food Council appears to be directed primarily to reducing the foreign exchange needs for food imports, as such imports impair the debt re-payment capacity and the industrial import capacity of African countries. With a shift in this intent, to one that recognizes the primary role of access to food in the African context, food strategies could serve to improve food entitlement systems as well as provide greater efficiency in the overall agricultural system and increase food production incentives.

4. The Struggle for Food Security at the Household Level

The poor, especially peasant farmers, have always assumed major responsibility for their own food security. The tendency for both commercial interests and governments to use, for their own interests, the productive efforts of peasants has made them reluctant to depend on others as a primary source of food security (e.g., see Wolde-Mariam, 1984: 517).

Very little systematic research appears to be available on the strategies employed at the household level to achieve food security. The information available is primarily on how peasant farmers attempt to cope with the effects of drought, although even here the information is frequently anecdotal in nature, drawn from newspaper accounts.

In preparation for a possible drought, peasant farmers will attempt one or more of the following: 1) if they are small farmers, seek to minimize risk by growing food crops (versus non-food cash crops) (Medani, 1972: 66); 2) grow a variety of food crops to minimize the probability of all food being destroyed by some natural calamity (Wisner and Mbithi, 1973); 3) in farm labour allocation, give priority to food crops (versus non-food cash crops) (Heyer, 1971); 4) build up reserves in the form of holdings of livestock; 5) invest significant quantities of time and resources in cultivating relationships with other households as a form of assurance in case of individual household calamities (Rempel, 1985: 6); and 7) seek to have alternative sources of income such as a business in the rural area and/or one or more persons employed in the formal sector (National Environment Secretariat, 1985b: 3).

When drought occurs, a hierarchy of coping strategies are employed (e.g., Faul, 1985 and National Environment Secretariat, 1985b). First, all feasting and celebrations cease. Such means of investing in relationships with other households cannot be sustained. Where possible, attempts are made to collect on such assurance investments made in the past: at the village level there may be some sharing of food; remittances from those employed elsewhere can be an important means to food; it may require a temporary move to live with relations located elsewhere.

A second level is consuming or selling off household capital assets. When the grain reserves are exhausted, the seed stock is consumed as well. Livestock is either consumed or sold. Once these are gone, other valuables such as jewellery and clothes are sold. The strong condemnation by government officials in Kenya of the practice of school age girls in some drought affected areas being given in marriage would suggest dowries were used as a means of obtaining food.

At the household level, consumption changes are made as well. First, consumption of 'luxury' food items such as meat, sugar and milk is reduced or eliminated (Nyanyintono, 1981: 40). Where available, food distributed by governments, religious organizations and non-governmental organizations is incorporated into the diet. In Kenya, during the 1984-85 drought, this meant a major shift for some to yellow maize (National Environment Secretariat, 1985b: 6). If food supplies are inadequate consumption levels are reduced. Where periodic food deprivation is endemic, the human body seems to develop certain capacities to function at nutrition levels considered too low by developed country standards. In part, this is accomplished by slowing down, reducing the level of physical activity (United Nations, 1984: 28 - 29). Within households, food distribution patterns favouring the able-bodied members, especially males, may well be instituted. Food is prepared while the children are sleeping; the elderly take a walk at meal time.

When all else fails, the village home is abandoned in a desperate search for food or for the means to buy food. The men tend to leave first: to seek employment, possibly because they cannot bear to see the members of the family wither away and die. It is the women who tend to bear the final burden of a starving family.

Comparable information does not appear to be available for food security strategies employed by non-farm households. Landless labourers,

both in rural areas and urban centres, are especially vulnerable during times of price inflation (e.g., Frankel, 1985). It is to be expected that in each class of people there are particular food security strategies employed at the household level. The poor, whatever their setting, are well aware of their vulnerable positions within the existing food entitlement system.

5. Policy Options to Improve Food Entitlements

A strategic store of staple food is a good starting point. To minimize transportation during a food crisis, the stores should be decentralized and located at points accessible to the geographic areas at greatest risk. Turnover of grain stored is essential. A flexible strategy, co-ordinated with international grain markets, could serve to both assure stored grain turnover and minimize storage costs. For example (these numbers are quite arbitrary), a country may choose to hold in store ten per cent of the country's annual consumption, initiate imports of food whenever the strategic stores are drawn down to five per cent of annual consumption; staple food exports are permitted whenever the strategic store exceeds twelve per cent of the annual consumption.

A complementary policy is improved on-farm storage. On-farm storage of food is encouraged,* but food wasted in the process of storage is seen to be high (Awiti, 1982: Community development Trust Fund, 1977). The development of better on-farm storage facilities will reduce food losses to rodents and insects, and reduce the dependency of farmers on traders and/or government institutions as the means of grain storage between harvests. One example now in operation in parts of Ghana, Ethiopia and Kenya is a stone/concrete silo which can hold up to two tons of shelled maize. Tests have shown the maize is good for planting after two years of storage and good for human consumption after five years of storage. The process is complicated -- the silo has to be constructed to be air tight, maize has to be dried adequately before it is

*During the 1984 drought President Nyerere of Tanzania encouraged farmers to maintain an adequate store of food and only sell food in excess of the household needs. Malawi has an enforced policy of on-farm storage. In a speech reported in the June 29, 1985 issue of the Daily Nation, President Moi of Kenya said: "Individual farmers should ensure that they have a granary at the farm level because only what is surplus to the family should be offered for sale. The national food security demands that food must be available at the household level at all times." (p. 1). The failure to store sufficient quantities of food to provide for the household until the next harvest comes in is seen as one cause of famines in Ethiopia (Wolde-Mariam, 1984: 518).

placed in the silo, chemicals or ashes have to be used to prevent infestation -- but has been shown to be within the capability of peasant farmers. Experimentation will be required to determine the means of storage that are effective and within the capabilities of the local people to construct, use and maintain. The process of community decision-making written up in Community Development Trust Fund (1977) is a possible model to be used.

A related issue is maintaining strategic stores of seeds. As seed stores held at the household level may be consumed during times of food entitlement collapse, an important dimension of recovery is the availability of seeds. Assuring a strategic store and/or source of appropriate seeds should be part of a government's food security strategy.

In locations prone to drought, sorghum and millet are more reliable crops than maize. Research and extension services, designed to develop and gain/maintain acceptance of sorghum and millet as food crops, would increase food security for the farmers involved (McGuire, 1981: 59).

Improvements in transportation and marketing networks can serve to move grain more efficiently from surplus areas to areas with food shortfalls. With improved market opportunities for food crops, other things equal, peasant farmers will produce more food. In situations of food entitlement erosion, more efficient transportation and marketing may be counter productive in the short run. Therefore, complementary policies, designed to prevent or offset food entitlement collapse at the local level, will be necessary to draw full advantage from improvements in infrastructure.

To address the food needs of the most vulnerable classes -- landless, farm labourers, unemployed and marginally employed -- food security policy should be focussed on the staple foods consumed by these classes. Their needs can be addressed by limiting food subsidies to such low income staples only. Increasing the producer price of such staples relative to prices of other farm outputs, combined with research and extension services vis-a-vis these crops, will increase the supply of low-income staples. With greater supply it may be possible to reduce the per unit margin of the food subsidy.

Pastoralists can continue to serve as an important means of using marginal land to produce much needed food. Land use planning is important to assure their access to traditional dry-season grazing areas. Here appropriate price policy, combined with efficient marketing and slaughter facilities, can

serve to encourage herd turnover during normal times plus reduce the extent of food entitlement erosion during times of drought.

Export crops play an important role in Sub-Saharan countries. Selective judgement needs to be exercised in any attempts to expand agricultural exports. The average yield for an export crop, at current world prices, may well command more food on the international market than can be produced on the land used for the export crop. But, if increased production serves to depress world prices of all exports of that crop, such additional export crop output is not likely to command more food on the international market than can be grown locally on the same land. Increased use of agricultural land for export crops should be limited to those crops where the international demand is sufficiently strong (or distinctly elastic) to absorb increased supplies at prices similar to existing prices.

Direct food intervention in the form of feeding stations or other forms of relief, should be seen as temporary measures only. Such intervention is direct interference in household decisions, which can have longer-term side effects. Food intervention programs need to be evaluated frequently to assure that they are not becoming a means of sustaining a food entitlement system that needs to be changed. Linking food distribution with food education, improved hygiene, primary health care and family planning can magnify the nutritional and family welfare effects of the food being distributed.

The policies outlined above can be undertaken by governments and non-governmental organizations with relatively limited political ramifications. More basic approaches to improved food entitlements involve structural changes in the economy which can be achieved politically either by careful nurturing of grass roots support or through revolutionary means.

Basic to food entitlements in the rural areas is the distribution of land. Given the rate of return to export crops and the prospect of continued food shortfalls, land is commanding increasing prices in the market. Land tenure systems that enable individuals to accumulate large quantities of land will be counter productive. This means households are denied access to the primary resource for food production, individuals are able to collect economic rents without contributing to the productive effort, the land generally will be utilized less intensively, and the distribution of income will become more skewed.

Closely related to land tenure is the overall agricultural strategy. Large farms tend to have few backward linkages to the economy and can by-pass local, small-scale marketing and processing facilities. Mellor and Johnston (1984), in their survey article on the world food situation, stress the need for an overall strategy to integrate all aspects of the economy rather than establishing two types of farming systems with conflicting interests.

Farming will decline over time as the dominant economic activity of the populations in Africa so overall employment strategies and anti-poverty policies are becoming increasingly important. The attempts at rapid industrialization have generated distinct dual economies. This dualism will not be easy to dismantle, but concrete action to bring the formal sector more in line with the opportunity costs of resources in the economy, producing output directed to the basic needs of all the people, will become a necessary complement to a unimodal strategy in agriculture.

Two further policy issues are presented for further consideration. Water is an important constraint to agriculture in many parts of Africa. Large-scale irrigation schemes have not proven to be economic means of producing staple food crops. Traditional approaches to irrigation exist in Africa (e.g., see Platikof, 1982). These approaches need to be considered as an alternative to the externally designed and financed schemes which are ill-suited to Africa's needs. Water can also be retained and used more efficiently through conservation methods and changes in tillage practices.

Finally, brief reference was made in the paper to regional approaches to international food security. This option needs to be explored in greater detail. It could serve as a complement to the proposed national strategic stores in some countries to countries in need at a point in time. An established regional system could also exercise greater political leverage in negotiations with food donor countries for supplementary supplies or food aid as required in the region.

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