

THE WORLD FOOD CRISIS FROM AN AFRICAN PERSPECTIVE

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IS THERE A FOOD CRISIS? A GLOBAL VIEW

There is sufficient food today for every man, woman and child on earth. In the developing countries as a whole, the last three decades have seen a doubling in aggregate food production. In fact, during the 1980s, food production increased by 39%. Even in Africa, total food production in the 1980s increased by a phenomenal 33% (Pinstrup-Andersen, 1993). If this were the end of the story, we would have had a happy ending. The reality is that the world today is undergoing the most confused and volatile period in recorded history. In the midst of plenty, there is still widespread food insecurity. The reasons are manifold.

During the 1980s, while China and the far East led the upsurge in per capita food availability, per capita food production fell in 75 of the world's poorest countries (Braun *et al*, 1993). At the beginning of the 1990s, per capita caloric intake (2 200 per person per day as calculated by the FAO-WHO Consultative Group on Nutrition) was inadequate in 25 countries.

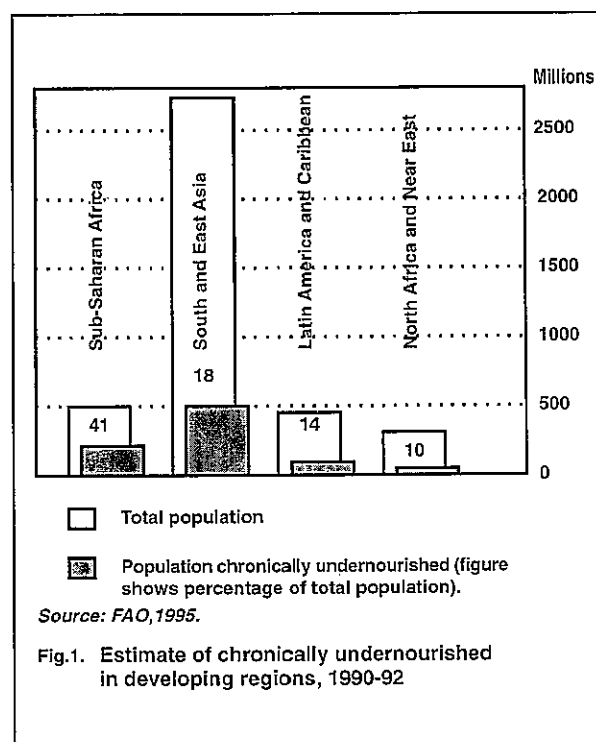
FAO (1995) defines food security as a condition when "all people at all times have access to the food they need for a healthy active life". This definition emphasises two of the four key elements of food security - availability and access to food. The other two elements that must exist for a nation to be food secure are stability of food supplies and cultural acceptability of the supplies.

Recent estimates by FAO-WHO based on the above criteria indicate that nearly one-fifth of the population of developing countries - about 800 million people - are chronically undernourished (Figure 1). About 40 000 people a day or a staggering 1 700 people an hour die mainly of malnutrition and poverty (Speth, 1993). Over 200 million children suffer from protein-energy malnutrition (PEM). Each year, the FAO estimates that PEM is responsible for the death of 13 million children under five.

Poverty is the root cause of food insecurity. The World Bank (1990) estimated that over one billion people in the developing countries were living in poverty. They live on less than one US dollar a day. Of this total, the proportion that was living in abject poverty was more than 60%. In terms of numbers, the greatest portion of these poor people was found in South Asia while

16% lived in sub-Saharan Africa. Hunger and food insecurity have a significant effect on health and nutrition of both adults and children. Such scourges as eye damage and anaemia are the results of deficiencies of vitamin A and iron respectively. Anaemia affects about 2 billion people worldwide. Malnutrition in children can impede learning and productivity and it is the leading cause of maternal mortality in developing countries (FAO, 1995). In developing countries, one child in three is underweight by the age of 5 (Pinstrup-Andersen, 1993).

On a global scale, therefore, there is no doubt that the world faces a food crisis of severe proportions. The *Bellagio Declaration on Overcoming Hunger* in the 1990s noted that "in a world of potential food plenty, we have collectively failed more than one billion of our people". The magnitude and incidence of poverty can be reduced if efforts are made to engage in labour-intensive rather than ill-founded capital-intensive growth and if adequate social services are provided. At the beginning of the 1970s, 41% of the people of East Asia were hungry. Through research and appropriate policy reforms culminating in the "Green Revolution", this proportion was reduced, by 1992, to 16% despite and increase in population of over 500



million. Poor farmers must have access to finance and productive resources including advice and technical help. It is vital to improve rural incomes, status of women, diets, and food distribution systems.

THE OUTLOOK FOR AFRICA

Africans have recently begun to use the term "marginalization" to describe their relationship with the rest of the world. It is a term born out of frustration and despair. More than thirty years after political independence, every social and economic indicator is pointing downwards. Agriculture has always been the engine of sustainable development in most African countries. In these countries, that engine is, at best, sputtering. At independence most countries had enough food for their people. The sub-par performance of the agriculture sector (Figure 2) has led to chronic food insecurity, increased poverty, malnutrition and associated diseases. Estimates are that one African in three is currently food insecure. Even though the numbers of the poor in other developing countries are expected to decline (World Bank, 1990), the numbers in Africa are expected to increase by almost 50% to 265 million in the year 2000 (Pinstrup-Andersen, 1993). Thus, even though slightly over 16% of the world's poor currently reside in sub-Saharan Africa, this proportion is expected to grow to 47% by the end of the century (Figure 3).

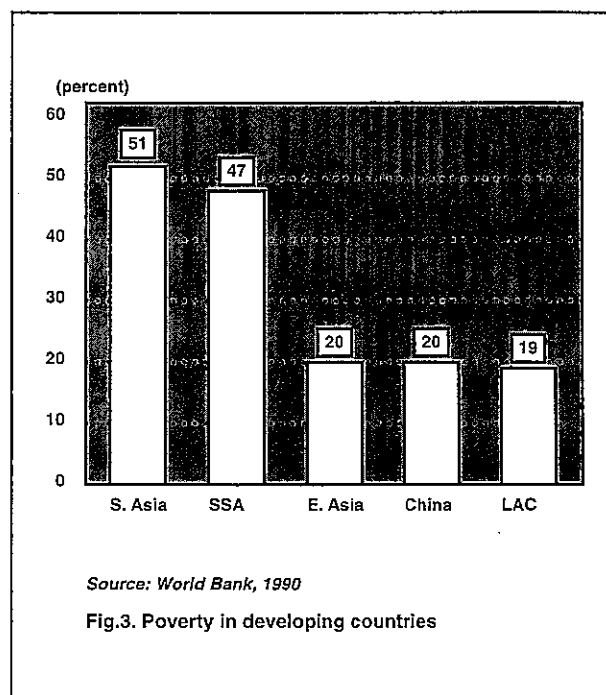
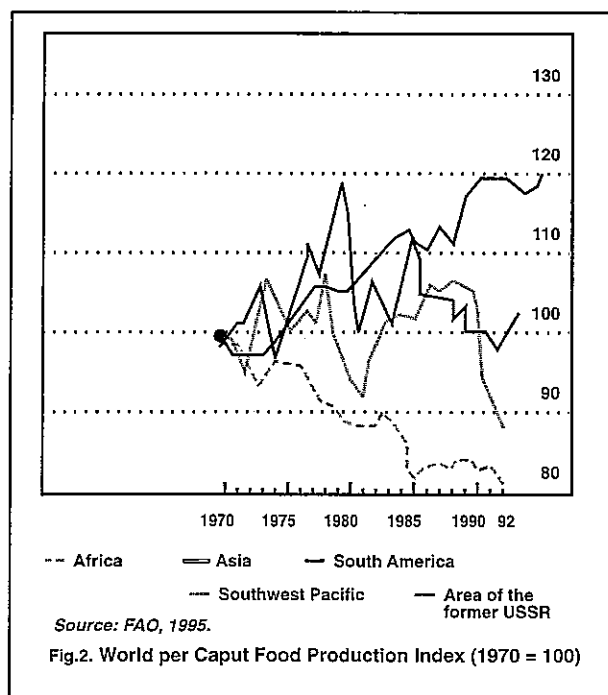
Demographic Pressure : The Social Time Bomb

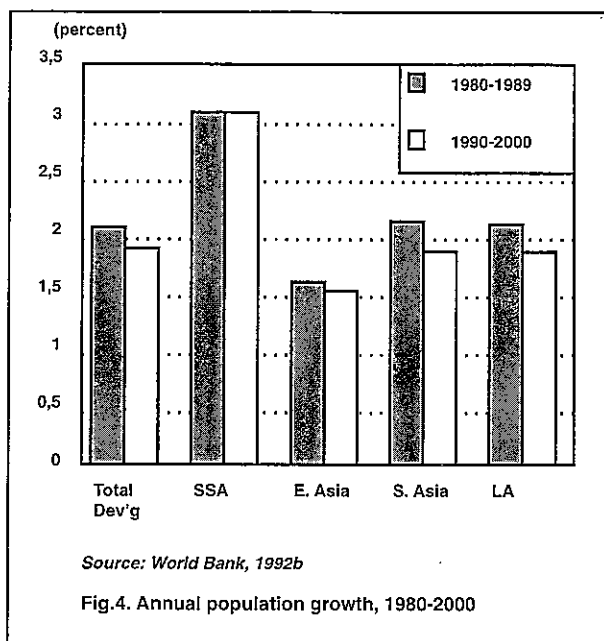
Africa's curse appears to be the very high rate of pop-

ulation growth. The population of African countries accounted for 12% of the world's population in 1992; this portion is expected to climb to 14% by 2000. For example, sub-Saharan Africa's population is projected to grow by an average of 25 million a year up to 2050. At an annual rate of more than 3% (Figure 4), this steep increase will result in a rise of the population from 490 million in 1990 to over 2 billion in 2050. For North, West and East Africa as a group, the population growth rate averages 3% per year (Table 1). At this rate, there would be a doubling of the population by 2015. Some countries within these subregions even show significantly higher rates of growth. Ghana, Zimbabwe and Tanzania have annual population growth rates of about 3.3%. Kenya, with an annual growth rate in excess of 4%, will double its population by 2010 (Strangel *et al*, 1994). The UN estimates that Africa would account for 34% of the projected increase in world population during the next 20 to 30 years (Pinstrup-Andersen, 1993).

Sustained high population growth rates affect almost every aspect of African society. Here are a few examples.

The food gap. As data in Figure 5 show, Africa has not always been food insecure. Between 1960 and 1975, sub-Saharan Africa met its food needs. However, between 1974 and 1990 food imports increased by 185% and food aid increased by 295% (Cleaver and Donovan, 1995). The trend projections (based on a 1986 IFPRI study) of both production and consumption of major food crops to the year 2000 are shown in Table 2. The data clearly suggest that the





30% and that import and export demand would expand in the same proportion. Even under this scenario, it would require a 3,3% per year increase in total food production to achieve the minimum satisfactory rate of demand for agricultural output by 2025. Given the unlikelihood that African governments would muster the political will and the capacity to make needed policy changes that could result in a tripling of agricultural production (agricultural production during the 1980s grew at an annual rate of 1,3%), one is left with the option of accepting the gloomy projection that the food deficit in Africa would increase to more than 250 million metric tons by 2020.

Urbanisation. Like other peoples in the developing world, Africans are migrating in large numbers from the rural to urban centres in search of "the good life". FAO (1995) estimates that the rate of growth of urban areas in sub-Saharan Africa is 6 to 8% a year. Because this migration generally involves the able-

Table 1: Population estimates for various regions of Africa

Region	Population 1992 (10 ⁶)	Growth Rate (%)	Population MID 2025 (10 ⁶)	Doubling Time (yrs)	% Urban
North Africa	147	2,6	274	27	43
Western Africa	182	3,0	449	23	23
Eastern Africa	206	3,2	528	22	19
Central Africa	72	3,0	182	23	38
Southern Africa	47	2,7	106	26	52

Source: Adapted from Stangel et al, (1994)

food gap would widen, and, for sub-Saharan Africa, the projected production of 110 million metric tons of basic food staples would fall short of projected demand, which is driven primarily by population growth, by about 50 million metric tons. Data from IFPRI's 2020 Vision for Food, Agriculture and the Environment conference in June 1995 suggest that if current trends are not checked, there would be an increase in cereal import from 9 million metric tons to 27 million metric tons by 2020. It is virtually impossible for African countries to acquire the foreign exchange necessary to import such massive quantities of cereals. Recent data (FAO/GIEWS, 1996) showing that food production in sub-Saharan Africa was below expectation by some 10 million metric tons in 1995 (a figure below the historical trend) support the IFPRI projection. The most optimistic "food demand scenario" recently developed by the World Bank, assumes that between 1990 and 2025 domestic demand would increase with population plus enough to increase per capita food consumption by

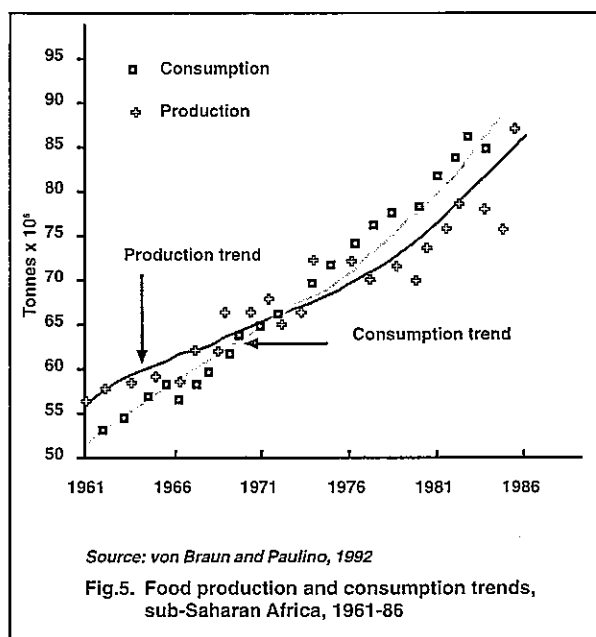


Table 2: Trend projections of consumption and production (million metric tons) of major food crops in sub-Saharan Africa to the year 2000

Country group	Consumption	Production	Surplus/Deficit
Sub-Saharan Africa	161,3	110,4	-50,9
West Africa	76,1	42,0	-34,1
Central Africa	24,4	19,2	-5,3
Eastern/Southern Africa	60,8	49,2	-11,5

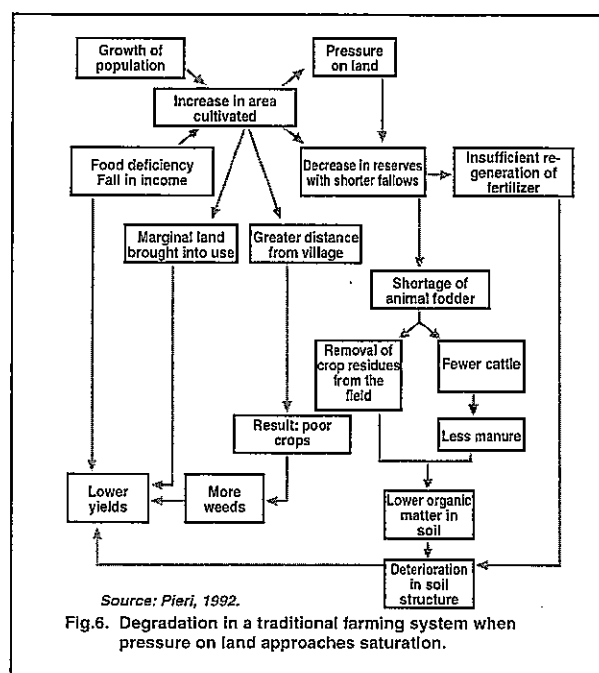
Source: Von Braun and Paulino (1994)

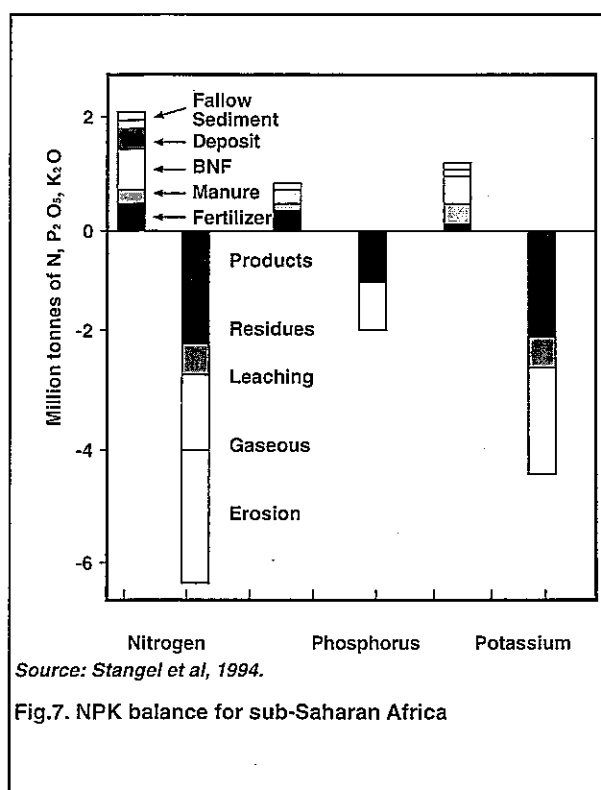
bodied (young and vigorous) people, there is a paradox of a labour shortage (mainly seasonal) at a time of high population growth. Large increases in urban populations have also placed severe strains on the already fragile food marketing system in sub-Saharan Africa, itself the product of poor infrastructure. As we shall note, the payment of high subsidies to keep imported food prices down for the urban people has crippled most African economies. The presence of cheap imports of rice, wheat, and meat is providing alternatives for the urban wage earner, thereby further dampening the incentives for farmers to increase the production of local staples.

Degradation of the natural resource base. To produce enough food for the increasing numbers of people, established practices for the restoration and maintenance of soil fertility as are typical of shifting cultivation have given way to exploitative, continuous cropping. Decreasing yields mean that marginal lands are brought under cultivation. Deforestation, uncontrolled erosion, loss of biodiversity, and overstocking have continued to destroy an already fragile natural resource base. Nature can be very forgiving but not indefinitely. *The Global Assessment of Soil Degradation* (GLASOD) project, coordinated by the Dutch-based International Soil Reference and Information Centre (ISRIC), estimates that 72% of African arable land and 31% of pasture land has already been degraded. FAO's first review of African agriculture was carried out in 1958. The review concluded that crop yields were declining in every region of sub-Saharan Africa primarily because high population growth had significantly reduced the length of fallow periods in shifting cultivation below what is needed for soil regeneration. The effects of increased population pressure on land degradation are summarised in Figure 6. The effects of the increased use of marginal lands for food production have been devastating. On an annual basis, it is estimated that 60 000 km² of land goes out of production (Mokwunye, 1994). In the southern fringes of the Sahara Desert, it is estimated that an area of previously productive

land the size of Somalia (0,65 million ha) has become desert over the past fifty years. Africa's woodlands and forests have not been spared either. Estimates are that nearly 4 million hectares of forests and woodlands are being deforested or degraded each year. It should not be forgotten that Africa's forests and woodlands have traditionally been the principal source of rural energy, building materials, food, and feed; in addition, they provide countless medicinal and industrial products. With the destruction of these forests and woodlands comes increased soil loss by water and wind. Soil erosion is a major cause of loss of productivity of African soils. For example, measurements made in Niangoloko in Burkina Faso showed that an increase in water erosion from 1,4 t/ha-yr to 13 t/ha-yr decreased millet yield by 52% (Mokwunye, 1994).

A phenomenon that is only now receiving the attention it deserves is the systematic removal of nutrients by crops without conscious efforts by farmers to replace these nutrients. This phenomenon has been





dubbed "nutrient mining". In the absence of a planned, consistent use of either off-farm or on-farm nutrient inputs, African farmers are mining their soils. The very negative N, P, K balances for sub-Saharan Africa is summarized in Figure 7. The results of an extensive FAO-funded work by Stoorvogel and Smaling (1990), which covered 38 countries in sub-Saharan Africa, showed that the sum of the nutrients added to the soils (inputs) less the sum of the nutrients removed (output) was -22 kg N, -2,5 kg P₂O₅ and -15 kg K per hectare per year for the period 1982 - 84. An in-depth study by IFDC-Africa of the fertilizer sector in Togo showed a similar trend (Table 3). The significance of these figures is magnified when it is realised that:

- The productivity of these soils in their native state is already low because of inherent low levels of nutrients.
- Sub-Saharan Africa consumes fertilizers (for both arable land and land under cash crops) at the lowest rate in the world which is approximately 10 kg of nutrients per hectare (Table 4).
- In the era of structural adjustment, there is intense pressure on governments to remove subsidies on fertilizers without suitable alternative policies to sustain even the current low levels of use of plant nutrients.

Table 3: Crop production and nutrient balance in Togo

	Nutrient applied as percent of nutrient taken up	Deficit in kg Nutrient/ha/year
N	23	-19
P ₂ O ₅	56	-4
K ₂ O	23	-15

Source: IFDC-Africa, Fertilizer Market Research Project

Table 4: Fertilizer consumption by region and world, 1991

Region	Nutrient (10 ⁶ mt)			Total NPK (10 ⁶ mt)
	N	P ₂ O ₅	K ₂ O	
Asia	37,3	13,8	5,3	56,4
Latin America	3,5	2,2	1,9	7,7
Africa	2,1	1,1	0,5	3,6
Europe	13,6	6,0	6,5	26,1
Former Soviet Union	8,7	7,8	5,1	21,6
North America	11,3	4,3	4,9	20,5
Oceania	0,5	0,8	0,3	1,6
Developing Countries	41,9	16,1	17,4	65,0
Developed countries	35,1	19,9	7,0	72,5
World	77,1	36,0	24,4	137,5

Source: Stangel et al (1994)

WHERE DO WE GO FROM HERE?

Towards an Unsustainable Future

In a world seemingly awash with surplus food, the notion of massive food shortages in Africa in a few years' time does not really sink in. There is the temptation to ask "Why not import food from countries up north who are producing surpluses?" The simple answer is that this surplus food is bought with foreign exchange. Foreign exchange-starved African countries cannot import the surplus food. There is some justification in the feeling that the odds are heavily stacked against the African farmers and governments. For them, the agricultural policies of the Organization for Economic Cooperation and Development (OECD) countries (the countries that produce the surpluses) have a protectionist character and tend to distort supply and, thus, prices on the domestic and international markets. For example, in 1991, in the then European Economic Community (EEC), sugar, milk and wheat prices were at least two times higher than world prices. Therefore, African countries that relied on exports of agricultural produce to obtain the foreign exchange needed for import of food were stranded. But even where food imports were subsidised thereby, reducing their prices, such imports have had negative influences on the production and marketing of local staples. Profitability at the farm level has thus been seriously threatened. Lacking incentives, farmers have diminished enthusiasm and confidence to invest in soil fertility restoration which could lead to improved agricultural production.

Effects of Structural Adjustment Programmes (SAP)

Shortly after independence, many African governments introduced interventionist policies to promote growth, equity and political goals (FAO, 1994). Low-income countries in sub-Saharan Africa initially enjoyed favourable terms of trade for their agricultural exports - mainly to their former colonial masters. Revenues expanded and public expenditures were made on infrastructure and social welfare programmes and on expanding the public sector into many new activities. These policies restricted the growth of private sector participation in economic activities while expanding the growth of government monopolies and especially the growth of parastatals. The parastatals handled input and output marketing. Subsidies were introduced on inputs such as fertilizers and on imports of food for urban dwellers. Over time, such restrictive policies and programmes led to inefficient resource use and unsustainable fiscal and balance-of-payments deficits. Parastatals became larger and more inefficient. By the 1980s, the prices of primary products sharply declined. Export earnings contracted and current account deficits grew. To reme-

dy the situation, the World Bank and the International Monetary Fund (IMF) pressured governments to reduce their public sectors and to remove various price distortions, especially in the exchange rate (Sanders *et al*, 1995). Governments were required to remove subsidies on inputs and food products. Currency devaluation was introduced as a means of reducing the balance-of-payment deficits.

Systematic studies on the effects of these measures on soil fertility restoration and maintenance and, hence, on food production, are scarce (Mokwunye *et al*, 1996). However, it would appear that currency devaluation has increased the profitability of the export crop sector in West Africa. This could improve the use of fertilizers and increase overall investment in soil fertility. By contrast, currency devaluation has not produced the desired effect in the food crop sector (Germer *et al*, 1995a). Farmers' income has not improved; therefore, investments in soil fertility have not increased. The removal of subsidies has, at best, resulted in stagnation of fertilizer use in the food crop sector in most West African countries (Mokwunye *et al*, 1996). Removal of subsidies has caused a general increase in fertilizer prices. This situation has been exacerbated by the devaluation of currencies. In Ghana, for example, the depreciation of the Cedi combined with subsidy removal in the early 1990s drastically increased fertilizer prices and decreased fertilizer use as fertilizer dealers transferred increased costs wholly to farmers. Germer *et al* (1995b) concluded that, all in all, the removal of fertilizer subsidies resulted in a further reduction of the already low Value/Cost Ratio (VCR) for fertilizer use on cereals in West Africa (Figure 8).

Effects of the General Agreement on Tariffs and Trade (GATT)

Since the 1950s, the main goal of the General Agreement on Tariffs and Trade (GATT) has been to reduce tariffs and subsidies on exports imposed by various countries. A major objective of the recently concluded Uruguay Round was to reduce tariffs on imports and subsidies on exports by about one-third. The full effects of the implementation of the Uruguay Round on African agriculture are yet to be felt. It would appear that even though the agreement binds Africa's farmers and Africa's crops to the laws of competitive marketing, there has been little political will on the part of the OECD countries to remove the protective measures enjoyed by their far richer farmers. As was noted by René Dumont (1991), "the peasant cereal farmer of the Sahel (with one hectare of degraded soil cultivated by hand and a harvest of 500 kg of millet if it rains) and the Western farmer — USA or Canada — (with 1 000 hectares of land, a powerful tractor and an enormous combine harvester

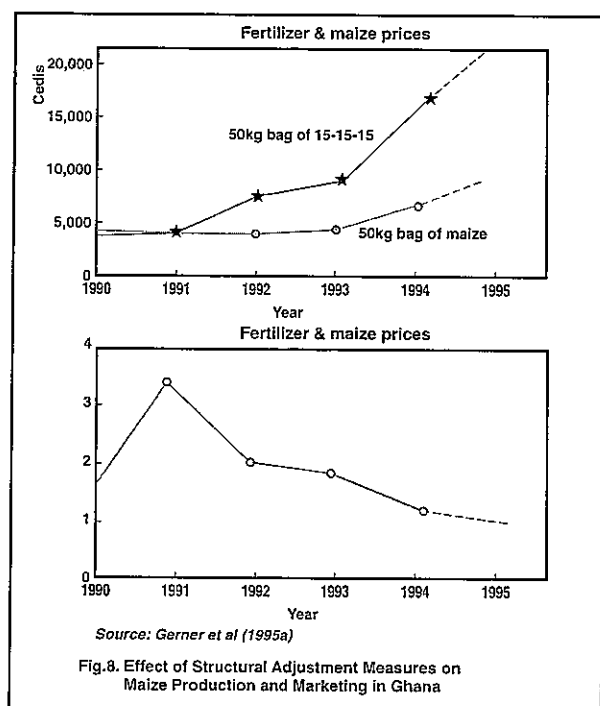


Fig.8. Effect of Structural Adjustment Measures on Maize Production and Marketing in Ghana

producing 2 000 tonnes of grain) are in free competition". There are, however, some discernible trends in West Africa that suggest the following (Mokwunye *et al*, 1996): There is apparent increase in foreign exchange earnings from the export of products such as cotton, cocoa and coffee. However, since these products generally carry less tariffs than grain crops, benefits from the liberalisation measures have been relatively small (Mokwunye *et al*, 1996). Furthermore, increased production of these crops by smaller producers have led to decreased prices in the world market. On the other hand, reduction in grain subsidies and other food exports or the reduction of tariffs on food imports has tended to increase prices of imported food. It would seem that for the moment, the "promised land" as far as the benefits of GATT are concerned, is still far away. Except for a few countries such as North African countries and some oil-exporting countries, the prospects of earning enough foreign exchange to pay for large quantities of food imports are very dim.

What about increased food aid?

Protective measures in the developed countries such as the Common Agricultural Policy (CAP) of the European Union have resulted in the production of "food mountains" in donor countries. These protective measures, as we have already noted, are harmful to developing countries. There is the temptation to argue that developed countries could transfer these "mountains" of surplus food to needy countries, but food aid has its disciples and detractors.

Without getting into the merits and demerits of food aid, it might be useful to describe briefly the various categories of food aid to ascertain if this option is a viable one for food deficit African countries. Ellis (1992) listed four different classes of food aid:

1. **Programme food aid** that is meant to be sold by the recipient countries. In terms of quantity, this is the largest category of food aid. It is also the category that has received the most criticism. Programme food aid is intended to influence the macroeconomic policy of the recipient country. Policies dealing with balance of payments and general level of food prices are intended to be influenced by programme food aid.
2. **Project food aid** is aid designed for use in specific food-related projects. These may include food-for-work and nutrition projects.
3. **Emergency food aid**, as the term implies, is provided to cater to short-term food insecurity caused by natural or man-made disasters.
4. **Adjustment food aid** which is delivered as part of a structural adjustment package.

A major argument against food aid is its influence on the domestic production of food. Although there are no verified data to support this argument (Singer, 1990), there is a case for arguing that programme aid, especially, has the potential to encourage recipient countries to adopt policies that create disincentives for their citizens to increase food production.

The arguments for and against food aid notwithstanding, the stark reality is that food-deficit countries in Africa need some help - now and not later. A major problem with food aid, especially in the quantities that are required, is that providing the logistical support for the distribution of such massive amounts of food would be a nightmare. The limited transportation and distribution infrastructure in the food-deficit African countries makes this option a nonviable one.

The most discouraging news is that global food supplies have tightened as a result of increases in world cereal prices. The effect of this situation, as was noted in a recent FAO early-warning report (1996), is that low stock holdings in major donor countries have caused a sharp drop in food aid allocations for sub-Saharan Africa. During 1994/95, FAO reported that 23% of Africa's food aid needs were unmet despite a drop in food aid requirements. This situation is expected to persist, thereby confirming the fears of many that food aid is not a reliable form of stabilisation. A key element of food security, stability of supplies, is thus missing.

Therefore, neither food imports nor food aid is a sustainable option for Africa. There is only one choice - increased local production of food.

Towards Increased Domestic Production of Food

From the foregoing discussion, it is clear that if nothing is done to reduce the food gap from the projected 250 million metric tons by 2020, there will be perilous and unpredictable consequences for both Africa and the rest of the world. If a "business as usual" attitude is adopted, African farmers will continue to mine the soils of their meagre nutrients. Rates of soil loss are already ten times the rate of soil formation. If left unchecked, the African landscape would have lost most of this potential for food production by 2010.

The need to improve yields

As was already noted, aggregate food production in Africa during the 1980s rose by 33%. The only problem was that food consumption grew at a faster rate and led to the projected food gap. More than 50% of the cereal production increases during the 1980s came from area expansion, unlike what was happening in the other parts of the developing world (Pinstrup-Andersen, 1993). Area expansion as a means of increasing agricultural production is no longer a viable option because of demographic pressure. Africa must join the rest of the developing world in recognising that increased yields must drive any expansion in food production. Data from China (Figure 9) demonstrate the effectiveness of yield increases in promoting food security. China and Africa had similar yield levels for wheat in 1961 at 0,5 tons/ha. By 1991, Chinese wheat yields increased six-fold to 3,4 tons/ha, more than double those of Africa. In China, maize yields increased from about 1,2 tons/ha in 1961 to 4,6 tons/ha in 1991. It is not an accident that these impressive yield increases coincided with dramatic increases in fertilizer consumption. For example, fertilizer consumption grew from 2,9 million tons in 1982/83 to over 7,7 million tons in 1988/89.

Much has been said and written about the low fertilizer consumption and constraints to fertilizer use in Africa (Table 4; IFDC-Africa, 1988). The latest FAO figures show that in 1993/94, Africa's share of world fertilizer consumption was 3%. What is needed in Africa is not simple policy reform measures that promote increased fertilizer use but, rather, the development and implementation of soil fertility strategies for individual countries that would improve yields of staples while maintaining the integrity of the resource base.

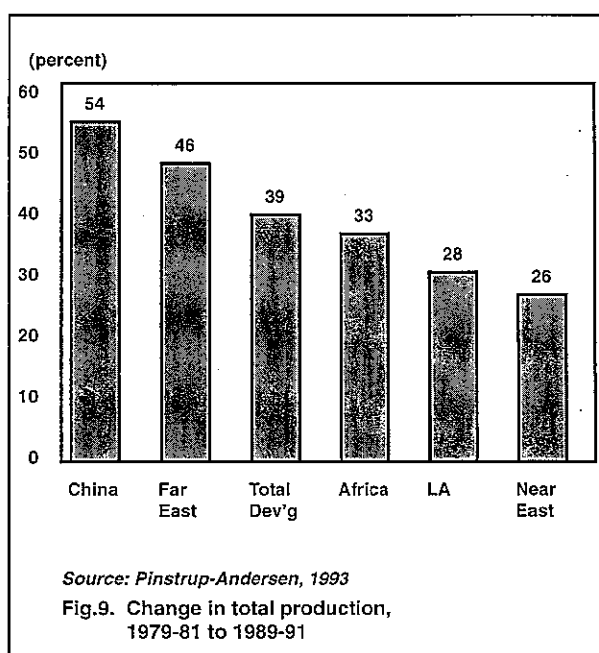
Restoring and Maintaining The Productivity of

African Soils

A significant portion of the African landscape is marked by deep and active gullies eating their way back into fertile arable land and rangelands that have been stripped of both their vegetation and topsoils. Increased demographic pressures have resulted in decreases in length of fallow periods. Estimates of the effect of this shortening of the length of fallow periods on yield declines range from 25 to 75%. Soil erosion, soil acidity, and weed infestation have increased. To reverse the trend requires the following:

Integration of livestock and crop production: The aim is to replace bush fallows with temporary but improved pastures with added nutrients improving vegetation growth, organic matter content, and quality of ensuing manure, which can be applied to food crops to increase production.

Improved crop and resource management strategies including integrated nutrient management practices that involve the combined use of mineral fertilizers and both off-farm and on-farm organic materials: Research in many regions of sub-Saharan Africa (Ssali *et al*, 1986; Bationo and Mokwunye, 1991) has shown that sustainable crop production is promoted by the use of mineral fertilizers in combination with such organic materials as compost and crop residue. Included in this effort is the use of local phosphate rocks to "recapitalise" African soils which are notoriously low in phosphorus. In addition to increasing the pool of nonreadily available phosphorus (the so-called P-capital, Figure 10) in the soils, phosphate rock acts as a soil amendment thereby improving the efficiency with which crops use other



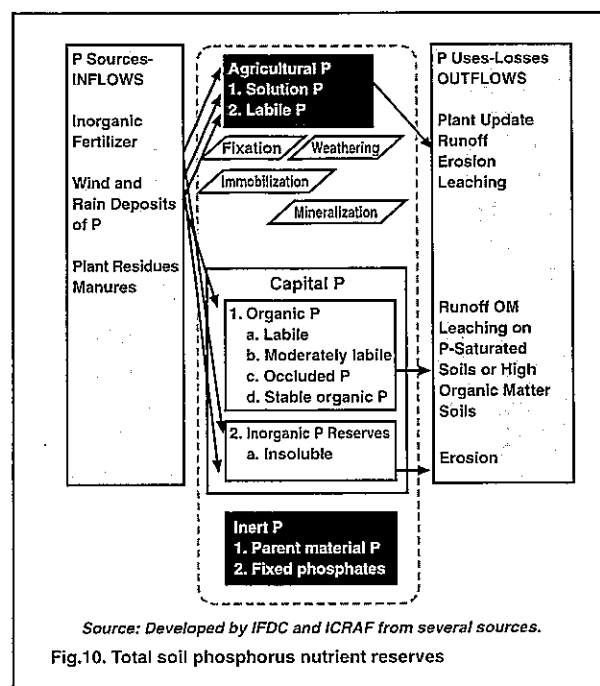
nutrients such as N and K. The World Bank is currently leading this "recapitalisation" effort with the collaboration of such organisations as the International Fertilizer Development Center (IFDC) and the International Center for Research on Agroforestry (ICRAF).

Integrated nutrient management practices also involve the use of leguminous crops and trees either inter- or relay-cropped to supply biologically fixed nitrogen. Some of these leguminous crops have also been found to be very useful in the control of noxious weeds such as *imperata cylindrica*.

The development of a comprehensive, integrated rural development agenda. Rural development efforts are fragmented and ad hoc in character. Measures to combat diseases often ignore complementary measures to improve food supply and nutrition. Farmers often learn ways to control water erosion by erecting barriers such as stone lines. However, the same farmers are never taught that improving the fertility of the lands where the anti-erosion structures are already in place would increase their returns on these investments. Cases abound where increased use of fertilizers in one year has resulted in severe post-harvest losses and decreased use of fertilizers the following year. An integrated rural development agenda should include the development of post-harvest technologies that add value to farm produce and the development of markets for both inputs and outputs.

Promotion at the supranational, regional, national and village levels of policies that are geared toward long-term sustainable agricultural development. Some suggested measures include (Mokwunye *et al*, 1996):

- Taking a second look at the impacts of Structural Adjustment Programmes (SAP) and the General Agreement on Tariffs and Trade (GATT) in view of the need to introduce incentives to promote fertilizer use and agricultural production. A compromise between fiscally unsustainable government outlays and complete withdrawal of agricultural sector support is required.
- Raising awareness of the threat of gross migration and the necessity for urgent action to promote food security through, for example, a worldwide funding of a "Marshall Plan" for Africa. This has to imply a long-term strategy and donor commitment with participation by all sectors in programme formulation, design, execution, review, and evaluation.
- Promoting effective interdisciplinarity and systems approaches in research and development through



broad-based ecoregional consortia.

- Encouraging the development of regional agricultural policy aimed at supporting the agricultural production sector and increasing food security in each region. This should include mild forms of market protection at the regional border for most vulnerable food crops, minimum price guarantees for essential food products, facilitating and promoting internal trade, joint procurement of inputs (fertilizers), and coordinated production/distribution of phosphate rocks.
- Establishing, in each country, Natural Resources or Soil Fertility Management and Development Units (such as the IFDC-assisted Soil Fertility Management Unit in Burkina Faso) to design and implement strategies for soil fertility restoration and maintenance. This Unit would also develop an inventory of natural resources available in each country for the purpose of increasing soil fertility.
- Establishing formal bodies that enhance linkages between national agricultural research systems (with adjusted research agenda signifying a shift from commodities and factors to systems), extension services, nongovernmental organisations and the farming community.
- Creating an "enabling" environment that promotes agricultural growth: action on credit schemes, clear-cut land tenure arrangements, support to institutional and physical infrastructure, fine-tuning of fertilizer recommendations for specific crop-soil combinations, and other non-financial incentives.
- Developing and implementing agricultural market development policies, including promotion of crop diversification, improvement of domestic and

export market structures, and market information.

- Formulating and implementing policy directed at creating economically viable off-farm employment in rural areas (eg, processing units for oil and karkité, small-scale manufacturing).
- Promoting participatory approaches to technology development and adoption. All actors in the national agricultural scene — farmers, research and extension personnel, NGOs, public and private sector activists — should participate in problem identification, analysis, and prioritisation of constraints. They should also participate in the development of strategies to overcome the constraints. In all of these activities, support from the donor community would strengthen national efforts.
- Promoting financial, technical and moral support specifically to women's groups. The role of the African woman in the production, processing, packaging and marketing of farm produce is legendary and so is her skill as an entrepreneur — constantly trying to create rural livelihood opportunities from the products of agriculture. Credit is often her primary constraint. African women have demonstrated that indigenous capital, though meagre, can be mobilised through such traditional credit schemes as "tontines" and "susu". Tapping this entrepreneurial skill to provide much-needed credit by promoting agri-based micro-enterprises is important because such enterprises are flexible and are usually built upon knowledge and skills that women acquire in the family.
- Promoting fertility build-up and intensified production on land that is of high potential (land that combines advantages like water, labour, proximity to homestead and compost pit, relatively high fertility) to give land without such advantages a recuperation break.
- Promoting and supporting farmers' organisations and NGOs to increase empowerment of farm households in general and their influence on policy, development programmes, research, and project formulation in particular.
- Implementing voluntary or mandatory group savings and credit schemes.

What Africa requires therefore is an action-oriented approach by all concerned to find solutions to the problem of low yields. The restoration and subsequent maintenance of Africa's soil fertility should occupy center-stage in the development agenda. Sustainable agricultural development in Africa will depend on a strong partnership between national governments (policy makers), research and extension workers, farmers, and private sector activists. Policy reform measures that promote open, competitive markets for both fertilizer products and farm out-

puts must be implemented. Africa's present and future food needs are huge. Finding ways to meet projected food shortfalls will be expensive. The world can invest wisely now by working with African farmers to improve the fertility of their soils or pay the more expensive price later in terms of instability, death, and destruction. The choice is a simple one.

ABSTRACT

The Bellagio Declaration on Overcoming Hunger in the 1990s noted that *"in a world of potential food plenty, we have collectively failed more than one billion of our people"*. Hunger and food insecurity have a significant effect on health and nutrition of both adults and children. Recent estimates by FAO-WHO indicate that about 800 million people worldwide are chronically undernourished. About 40 000 people a day or a staggering 1 700 people an hour die mainly of malnutrition and poverty (Speth, 1993). Over 200 million children suffer from protein-energy malnutrition (PEM). Each year, the FAO estimates that PEM is responsible for the death of 13 million children under five.

One African in three is food insecure as a result of abject poverty. Poverty, environmental degradation, and low agricultural productivity are interlinked. Sustained high population growth rates have led to increased degradation of the resource base for agriculture. Lacking technologies to improve yields of basic staples, African farmers have continued to mine the soils of their meagre nutrients. In the meantime, reduction in agricultural productivity has led to an increased food gap. Food production must grow at an annual rate of 3.3% to eliminate an estimated food deficit of 250 million metric tons by 2020.

To improve the food situation, African agricultural growth must depend on improved yield rather than on expansion of area under cultivation. Measures to restore and improve the productivity of the soils include:

- Integrated nutrient management practices involving the combined use of inorganic fertilizers with both off-farm and on-farm organic materials.
- Integration of livestock and crop production.
- The development of a comprehensive, integrated rural development agenda.
- Promotion of policies that are geared toward long-term sustainable agricultural development at the supranational, regional, national, and village levels.

An action-oriented approach by all concerned is required to find solutions to the problem of low yields.

The restoration and subsequent maintenance of Africa's soil fertility should occupy center-stage in the development agenda. Sustainable agricultural development in Africa will depend on a strong partnership between national governments (policy makers), research and extension workers, farmers, and private sector activists. Policy reform measures that promote open, competitive markets for both fertilizer products and farm outputs must be established. Africa's present and future food needs are huge. Finding ways to meet projected food shortfalls will be expensive. The world can invest wisely now by working with African farmers to improve the fertility of their soils or pay the more expensive price later in terms of instability, death, and destruction. The choice is a simple one.

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