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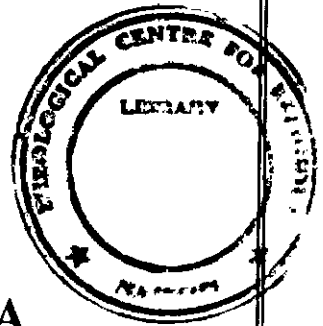
INSTITUTE OF SOCIAL MINISTRY

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THE FOOD CRISIS

IN

SUB-SAHARAN AFRICA



An Essay on Food Security Issues in the region

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DEDICATION

I dedicate this essay to my father, Kabagambe and to the memory of my late mother, Naiti. Their concern for my education was meant to assist me out of Africa's peasant plight.

These pages, attempt to portray, in a broader context a similar concern.

DECLARATION

I hereby declare that the material used herein has not been submitted for academic credit to any other institution. All sources have been cited in full.

VINCENT K. KABAGAMBE

Signed: _____

Kabagambe

INTRODUCTION

Food is the prime sustainer of human life. Yet, no other region in the world finds itself so haunted by food insecurity. While Latin America's per capita food production is rising and population growth rates decreasing, exactly the reverse is true of Africa. Whereas health improvements elsewhere are recorded, drought and famine continue to impair the health of Sub-Sahara's enormous populations, particularly its children and elderly.

By 1985, some 150 million African - more than a third of the region's population - depended partially or totally on imported food. Even currently, the World Bank estimates 60% of these human lives as consumers of fewer calories than required for normal life. This helps to explain why 5 million children in Africa die every year and another 5 million are crippled permanently by malnutrition and hunger. If this essay will expose the depth of the food crisis, in order to trigger useful responses from its readers, then its purpose will not have been in vain.

This Essay seeks to address the complex question. What has gone wrong in Africa? It does so from one, but nevertheless vital angle: The Food and Agricultural sector. Space and time have restricted me to a summary discussion of the defects in the structures and systems of this sector typical of Sub-Saharan Africa; and also the factors judged to be responsible for people's inaccessibility to adequate food supplies.

I selected Kenya as a case study of specific constraints that block achieving food security. A series of significant issues were then underlined as crucial to Kenya's food security.

It is important to note that this essay claims neither strict professional nor exhaustive treatment of the topic. For instance, no marine food sources were discussed, statistical computations and inferences are minimal. Specifically, the scope of this project has sought to be informative on the need to transform structures, factors and systems that render food security an illusion for Africa.

Basically, the research design (method of data collection and analysis) is largely random.

This means that when referring to Sub-Saharan Africa, every country within this population (region) has the same or equal chance of being considered as a case for reference. South Africa and Nigeria are not components of the population. Even in the case of Kenya, all data is provided on a random basis.

The data for the research project was all gathered and summarised either as deductions from already published researches, documents or papers; or as personal perceptions and syntheses on the subject. Tables and figures in the text were borrowed from sources given in footnotes.

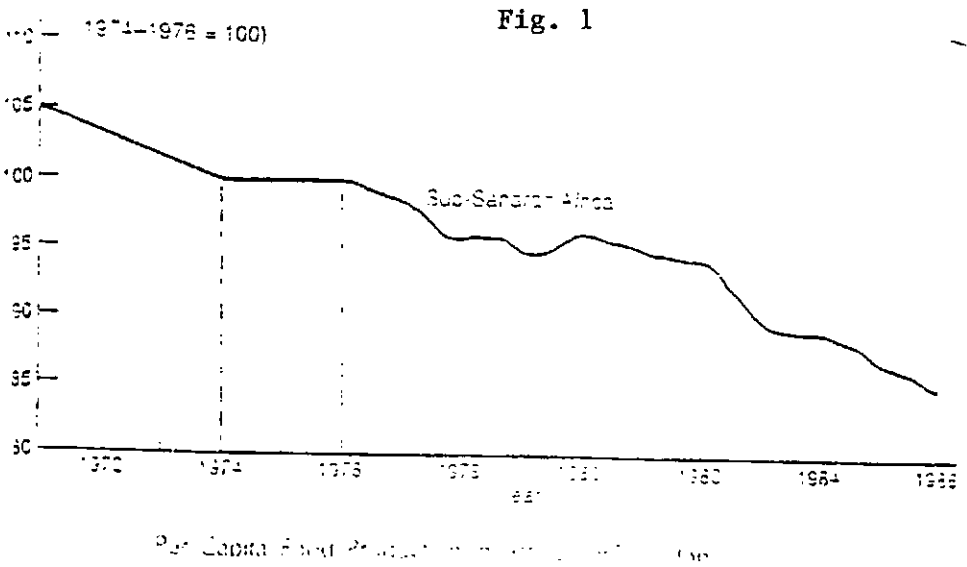
In a special way, I wish to express my gratitude to the following:

1. My lecturers in the Institute of Social Ministry, Tangaza College. Without their tuition and guidance, I never would have awakened to the development issues of the African world.
2. The Benedictine Communities of Tororo and Tigoni who enabled me to persevere at the 'famous Tangaza College'.
3. Miss Kamiti, whose keen interest and effort in printing my drafts produced the final copy required by the college standards.

CHAPTER 1.0 THE FOOD CRISIS IN SUB SAHARAN AFRICA

1.1 THE NATURE OF THE PROBLEM

The Food and Agriculture sector¹ is the chief support of most Sub-Saharan Economies. In 1981 alone it generated up to 67% employment and 40-60% of GDPs. But despite this important contribution, food output has declined steadily since the 60s. For vast regions of Africa's populations, a crisis of chronic food insecurity, mounting food import bills and serious diet deficiencies are the consequence. Besides, there has been the continued depletion of natural resources so necessary for sustained agriculture. As can be seen in Fig. 1 below, per capita food production declined sharply in the 60s and worsened in the 70s through the 80s.²



¹Agriculture in this context, refers to all activities directly involving it, PLUS also activities indirectly relating to the sector, ie. management and development of natural resources, research, crop/livestock production and development, fisheries, services, training and extension etc. PLUS forestry, agro industries, rural infrastructure development, etc....

²Source: **Todaro P. Michael: Economic Development in Third World**, Longman Group, Uk Ltd., England; 1992 (Page 295)

This shows that the past three decades have deprived the average African in his level of food consumption. Yet, food consumption makes the most important component in a typical African's standard of living. So, the sharp decline in both per capita food production and consumption meant increased underdevelopment for the region as a whole in the period 1972 - 1986. The reasons for the negative growth of per capita food production range from severe deforestation and erosion, cultivation of marginal lands, insufficient and inappropriate innovation, incentive-reducing pricing and marketing policies. All these occurred when the region (Sub-Sahara Africa) went through a period of the highest population growth rate it ever did.³

Persistent drought and famines in many parts of Central and Eastern Africa have worsened the problem. Food and fertiliser prices had to rise. Growing population, increased scarcity of agricultural resources and the rising prices of food all meant a fall in living standards. This is a hard problem which continues to be experienced by large African population which spends about 80% of their income on food.⁴ The Food and Agriculture Organisation warns (for the 1990s) that more than 200 million of Africa's 300 million people are faced with some form of malnutrition associated with inadequate food supplies; Geographically, this effect stretches in more than half of the African countries. Often, starvation has been triggered by drought and war and countries become dependent on food aid eg. Ethiopia, Sudan, Kenya and Liberia. War can be considered the result of misguided policies. But we cannot dwell on such points alone without explaining why and in what way public policies are misguided, what practical plans can be followed towards a solution. The poor performance of the food and agriculture sector explains Sub-Saharan Africa's current 'economic sickness'. The sector is a crucial determinant affecting all other sectors of national economies. It is evident therefore that small holder agriculture holds an important key to the development of countries thus affected.⁵

³Todaro P. Michael, *Economic Development in the Third World* (Pgs. 202 - 204)

⁴Ibid

⁵Adebayo. A & Shaw T. (Eds) *Economic Crisis in Africa: Paper by Pallangyo EP. & Odero-Ogweyo* (Pgs. 169 - 171): *The Persistence of the Food and Agriculture Crisis in Africa*, Lynce Rienner Publication, Colorado, USA, 1985.

1.2 INHERENT CAUSES (An Overview)

Inherent causes are the roots of the food problem which today are often permanently attributed to Sub-Saharan Africa.⁶ The region, since the 1960s, has continued facing a vicious cycle of food shortages and in extreme cases hunger. There are, however, differences of perception regarding causes for this situation. A variety of factors are cited by Development experts, Economists and Researchers. These include inter alia, population growth rates superseding food supply growth rates, overdependence on rain for farming, ineffectual food-security policies and the adverse impact of structural adjustment programmes on vulnerable African population. Besides overdependence on the highly variable and erratic rainfall, the recurrent droughts also precipitate large scale sub-regional food emergencies like those of 1971/72, 1983/84, 1992/93 and 1994/95.

Land degradation due to soil erosion has contributed to low food yields. The region lost 3 million tonnes of grain (1991/92) due to drought and desert encroachment.⁷ A combination of other factors like the poverty of a majority of the people, transport and storage difficulties, wars and political instability, ecological conditions, poor balance of payments, the debt burden of most African countries, the protection and subsidies for food producers in industrialised countries, lack of access to water and effective low cost, yield-enhancing technology, all interconnect to uphold the food crisis.

The basic difference in perception of the population growth-rate notion is that whereas certain views regard it as fundamental to the food shortages, others consider it only as an intensifier⁸ rather than a causative factor to the food crisis. It is important to be cautious however about the above conventional explanations of the food problem. Removing one or several of them would per se not solve the problem.

⁶The term Sub-Saharan Africa in this paper shall hereafter be referred to as Africa.

⁷All Africa Press Service, *Africa Church Information Service* : FOOD AFRICA, June 24, 1996 (Pgs. 1 - 2)

⁸It would be naive to think that population growth rate in many African countries is not a serious intensifier of the food insufficiency.

1.3 ROOTS OF THE FOOD CRISIS IN SUB-SAHARAN AFRICA

1.3.1 The Food Production versus Population Growth Argument

This view has it that Africa's population growth rates of 1.5 - 2.0% in the 1960s was modest. New land was more or less cultivated by subsistence farmers without foreign aid-financed food production projects. There was basic self sufficiency in staple foods. Countries like Senegal and Nigeria even exported groundnuts to Europe. But since independence, food production has grown at half the population growth rate, particularly since the 1970s. Current growth rates of population in Africa are at 2.5 - 4.4%.⁹

The point here is that, by historical standards such rates are extremely high suggesting a population doubling over a period of 15-20 years for most countries. Practically, this involves increasing pressure on land and natural resources eg. fuel-wood, grazing areas and cultivable land as it is converted to alternative uses. In this regard, as no country shows signs of fertility decline, the view that Africa is land abundant is seen as misleading.

It is also held that there is in the region:

- i) Unequal population distribution in relation to the agricultural potential.
- ii) Political barriers to people seeking migration to the land abundant countries of the region.

Therefore, attempts to calculate the region's total food production potential becomes irrelevant to the ability of a sub-region eg. the Sahel or a country like Kenya to feed its population. Such totals thus fail to project a true picture of the situation, as dependence on food aid increases. But apparently, the population threat so presented is open to objection. If unequal population distribution is the issue emphasised, then the problem

⁹Berg. J. R. & Whitaker S. J. (Eds), *Strategies for African Development*, Council on Foreign Relations Inc., LA-USA, 1986: Paper by Carl K. Eicher: *Strategic Issues in Combating Hunger* (Pg. 244)

is not the number of people per se. Here precisely, the phenomenon of rural-urban migration is implied. So, rather than focus on reducing population rates, governments should strive to tackle rural-urban migration and influence a more balanced population distribution in terms of the available productive resources eg. land.

Another argument against the 'population-threat' view centres on underdevelopment¹⁰ as the real obstacle. As long as the majority of people in Africa remain poor, uneducated and hungry, faced with high death rates, their only social security is in large families. The assumption is that out of eight children, three might survive to become breadwinners for parents in old age. Food insecurity thus becomes the underlying cause maintaining the vicious cycle: Hunger = more children = more hunger.

Another objection to the argument underlined asserts that population can only be a problem in relation to the availability and utilisation of scarce resources. If the average European consumer uses up to 16 times as much food as his counterpart in Africa,¹¹ then the addition of one child to a European family is as good as adding sixteen to the African family. Basing on this premise high fertility in Sub-Saharan Africa is due to low levels of living - a consequence largely attributed to overconsumption of the world's scarce resources (e.g. financial and food) by the rich nations. Accordingly, this rising wealth, extravagant and selfish consumption habits, together with that of rich people within affected African regions, should be the major concern, NOT population growth.

¹⁰Simon Arthur, *Bread for the World*, Paulist Press, 1984 (Pgs. 32 - 34)

¹¹Todaro P. M., *Economic Development in Third World*. (Pg. 203). In Table 1 the developed countries which make up less than a quarter of the world population consume 80% of the world's resources.

Table 1**Consumption of Major Resource Commodities, by Region:1984**

Population and resource	Developing countries	Developed countries	USSR and countries	Eastern Europe
Population (millions)	3,592		792	388
Percent of total	75.3		16.6	8.1
Commercial fuel (metric tons of coal equivalent, thousands)	1,953,187		4,603,77	2,241,617
Per cent of total	22.2		52.3	25.5
Per capita (kilograms)	543.8		5,816.0	5,777.4
Steel (metric tons, thousands)	200,656		313,799	193,87
Percent of total	28.6		44.3	27.4
Per capita (kilograms)	55.9		396.2	499.7
Cereals (Production) (metric tons, thousands)	929,000		595,704	276,980
percent of total	51.6		33.1	15.4
Per capita (kilograms)	250.3		752.2	713.9
Wood (cubic meters, thousands)	91,400		363,000	178,600
Percent of total	14.4		57.3	28.2
Per capital (kilograms)	24.6		458.3	460.3

1.3.2. The Colonial Legacy

Colonial powers regarded African farming systems as backward because they produced no marketable surplus for the exploitive interests of the colonisers. So, these diversified, self-provisioning traditional systems were reduced to one or two cash crops. Here lie the origins of food dependency. African economies were established to produce for external demands rather than internal needs.¹² This has been perpetuated by post independence government. Capital-intensive, high technology farming systems from European aid displaces small farmers from control of their land and labour, thus crippling self-sufficient farming.

As early as the 20th Century, French Colonists forced their self reliant (in food) subjects of the Sahal (West Africa) to cultivate peanuts and cotton, respectively for cheaper livestock feed and the textile mills in France. The Colonists in many cases took over the best lands. The fertile Kenyan highlands were granted to British Lords often in tracts of over 25,000 acres. Private ownership of land was introduced.

¹²Predergrast John & Miller Terrence. A Guide For Activists on African Hunger., Washington, USA., 1995 (Pgs. 6 - 7)

previously, land was accessible to all. Landlessness then onward became common. The traditional patterns of production and exchange in Africa were thus destroyed by Colonialism although a minimal diet for all was ensured by them.¹³

Furthermore, development projects begun by Northern donors and African governments failed to deliver. Until recently, no respect or study was given to local African farming and pastoralism approaches. European and American approaches were favoured against 'the primitive' by aid organisations. The heavy machinery and chemical fertilisers often destroyed the fragile soils. Driven by short-term economic gain, natural eco-systems have been destroyed as forests, soil and water resources are exploited, threatening the sustainability of food systems¹⁴ To understand the present food crisis in Africa, one cannot skip reviewing its Colonial past. Colonialism introduced also a relationship with the West based on very exploitative and unjust terms, causing poverty of most Africans.

1.3.3 Agricultural Trade, Food Aid and the Debt Trap

Africa's export of raw materials and import of finished products has persistently proved itself a disadvantaged strategy. World market prices for raw materials and cash crops have steadily fluctuated, while prices of manufactured imports increased 5 - 10% annually.¹⁵ Peasants are ruined in the process as they struggle to invest more in production for cash at the expense of food production. Peasant farmers normally receive far less prices for their cash crops, not enough to cover necessary production investments and food needs for their families. Also, cotton has been replaced by synthetic fibres, copper by glass fibre optics and sugar by nutrasweet. Africa has lost 50 billion dollars as a result of falling commodity prices and such substitution since 1986. yet, Africa's attempts to export finished products meet trade

¹³Food First Resource Guide: Documentation on Roots of World Hunger and Rural Poverty., Institute for Food and Development Policy., San Francisco, CA - USA, 1979 (Pgs. 14- 19)

¹⁴Predergrast J. & Miller T., A Guide for Activists: Handbook on African Hunger Issues (Pgs. 7 ft.)

¹⁵Changing Factors in World Development., Development Issue Paper 5, Global One., UNDP, 1975. (pg. 11)

barriers of the North.

In non-emergency situations, the dumping of subsidised grain or the delivery of food aid benefits the donor more than the recipient. In Burkina Faso, imported wheat is sold at a third lower the production and marketing cost of local food staples such as millet and sorghum.¹⁶ Heavily subsidised food imports from USA and EC destroy domestic markets for small holder local producers, reduce household incomes and discourage investment in agriculture.

The experience of Zimbabwe in Mid 1980s illustrate the damaging effects of subsidized food dumping on national and regional food security. The country's surplus stockpile of maize at that time was enough for export to regional food-deficit neighbours. US-EC maize imports flooded local markets at about a half the prices paid to Zimbabwean producers. The Grain Marketing Board, under World Bank advice, had to sell its maize stockpile at a loss, leaving it with a huge financial deficit. The result: when the 1992 drought struck, Zimbabwe had no food reserve and had to turn to costly imports of food.

In 1991, the EC's export of 54,000 tons of beef to West Africa did havoc to local markets. Nomadic pastoralists grazing on environmentally fragile lands have been thrown into competition with Europe's heavily subsidised meat industry. The farmer has been forced out of markets eg. in Senegal and Burkina Faso. Even EC development agents have complained about the damaging effects of beef dumping on EC funded projects meant to improve production for pastoral farmers - an example of the discrepancy between aid and trade policies.

Since late 1960s the droughts which forced unplanned food imports, wars which required weapons purchases, enormous oil price increases, world recession and falling prices for Africa's exports all contributed to its accumulated debt. By 1990, its debt was at 272 billion dollars, equal to 90% of the region's GDP. Between 1982 - 1990,

¹⁶Africa, Make or Break: Action for Recovery, Oxfam, 1993 (Pgs. 28 - 29)

it was a net supplier of capital to the North, transferring 4 billion dollars in debt service.¹⁷ In such cases, the IMF determines additional loans for the debt-burdened countries basing on foreign exchange and trade balances. Favourable credit-rating however, is earned upon acceptance of IMF advice: reduced public spending, increased taxes and currency devaluation - all of which penalise the poorest sections of the population struggling to produce food. Sub-Saharan economies therefore cannot afford food subsidies else they are in danger of losing IMF 'drawing rights'.

1.3.4 Wars

The people's entitlement to food in many Sub-Saharan countries has been eroded when due to war, crops, land and the environment are destroyed; resources are diverted from development to the military; populations are displaced; access to emergency aid is blocked; the press is suppressed; trade and economic activity are disrupted as insecurity threatens everyone. War is the most frequent reason for famine. Liberia, Mozambique, Chad, Uganda, Angola, Somalia, Sudan and Ethiopia have each experienced famine caused by wars. Africa spends 14 billion dollars on ammunition and weapons annually. The cost of tank is estimated at that of building 1000 classrooms, whereas that of a helicopter is worth the salaries of 2000 school teachers.¹⁸

Significantly underlying many conflicts in the region however, are the inequalities in the control of productive resources within nations, eg. cultivable land. In this regard, local disputes tend to resort to wars and civil strife. The conflicts in Rwanda and Zaire (Kive and Bukavu) besides carrying ethnic hostilities contain this element. Established multinationals bought large areas of the best lands for their plantations and mining, leaving peasants landless and impoverished. The cycle of conflicts and

¹⁷Prendergrast J. and Miller T., A Guide for Activists. Handbook on ... (Pg. 8)

¹⁸Prendergrast J. and Miller T., A Guide For Activists. Handbook on (Pgs. 8 - 9)

wars is thus maintained.¹⁹

1.3.5 The Hunger-Poverty Correlation

Table 2

Population with Consumption below Caloric Requirements

Region	People (millions)	Percentage population
Latin America	112	36
Asia	707	63
Middle East	61	33
Africa	193	61
Total	1,073	55

Source: S. Reutlinger and M. Selowsky, *Malnutrition and Poverty: Magnitude and Policy Options* (Baltimore: Johns Hopkins University Press, 1976). Published for the World Bank by the Johns Hopkins University Press.

Hunger is the lack of adequate nutrition on a temporary or continuous basis. The hunger problem should be seen in terms of availability (ie. having enough food to feed the entire population) accessibility (food being within the reach of all sections of the population) and adequacy (able to meet the nutritional needs of the different sections of the population). Most African countries have not enough food to feed their populations. They face hunger and malnutrition mainly due to one or more of the following.

- i) Low productivity of family labour on subsistence farms.
- ii) Unstable output levels due to drought.
- iii) Lack of access to land.
- iv) Lack of income to purchase adequate food on a timely basis.

Poverty is a major cause of hunger because it prevents people from purchasing a

¹⁹Churches' Drought Action in Africa; Studies of Sub-committee Report on Root Causes of Hunger and Food Insufficiency in Africa; Harare, Zimbabwe (Pgs.35 - 36)

calorie-adequate diet. The majority of the poor in Africa are subsistence farmers producing food at low levels of labour productivity compared to their productive potential. Mostly these are small farmers, tenants and sharecroppers. The important question here is why?

- i) They certainly lack the economic and political power, they are unable to get credit and so have no access to agricultural inputs such as fertiliser and pesticides to make their land produce more.
- ii) The motivation of tenants and sharecroppers to improve their land is low because they know their labour will benefit the landowner, not themselves.

Where the majority are cut off from sharing in the control of food-producing resources, their poverty means that they cannot make their needs felt in the marketplace. Food producing resources therefore are made to serve those who can pay - the upper class of people and the markets abroad. Export and luxury goods expand consequently while basic food crops are neglected. Considering the hunger of so many, this is a misuse of resources existing within a system of inequitable control of the same. This is poverty built into a complex root cause of hunger in Africa.

The hunger situation in Africa is basically the result of a vicious cycle of poverty, a human arrangement whose root causes are both historical and current. The historical causes explain the continued and irresponsible exploitation of the region today. The current should be seen in terms of the drought per se, political instability, inappropriate economic, social, cultural etc. policies which result in famine, misery, malnutrition, ignorance, low productivity and high population growth.

Yet to say that hunger is caused by rapid population growth, insufficient land and water resources, climatic disasters, peasant ignorance backward technologies, slow economic growth, unnecessary spending on armaments and luxuries and protection and subsidies for agricultural producers in the industrialised world, implies that doing

away with one or two of these factors would be a solution. This is not true. Attempts to analyze the causes of the food crisis therefore ought to reflect this complex network of interrelationships at local, national, international and regional levels.²⁰

CHAPTER 2.0 FARMING IN SUB-SAHARAN AFRICA

2.1 THE RURAL AGRICULTURAL

In most Sub-Saharan economies, the labour force is dependent on rural located agriculture. Sometimes as much as 50 - 80% of national populations directly depends on small scale farming for their livelihood. But rural farming still accounts for very low output compared to that of developed countries, even in their early states of growth. Agricultural employment in most African countries is twice as large as output. this reflects the relatively low level of labour productivity compared to their manufacturing and commercial output.²¹ The poor food production performance can be partly attributed to the neglect of the agricultural sector in development priorities of governments. There was sometimes the misplaced emphasis on rapid industrialisation. However, the shift typical of the 70s through the 80s gave rural agriculture greater appreciation.

In many parts of Africa, agricultural production methods have changed relatively slowly. this stagnation of technology can be traced in the nature of the rural peasant agriculture with its high risks and uncertain rewards. The problem is further consolidated by rapid rural population growth which inevitably exerts pressure on the existing resources. In many infertile lands, rapid population growth has led to an increased number of people living on each unit of land. given the same farming technology and use of traditional inputs like, simple tools, animal labour and

²⁰Solon L. Barraclogn; An End to Hunger. The Social Origins of Food Strategies; Zed Books, London, 1991 (The introductory pages)

²¹Todaro, Michael - (Pgs. 292 - 293)

traditional seeds, diminishing returns result. the marginal (and average) productivity of the farmers tends to decline. So sustained food production of the rural peasants is thus affected. However, in order to transform the rural agriculture of the regions under discussion, the structure and organisation of their farming ought to be understood first.

2.2. THE STRUCTURE OF FARMING

If agricultural productivity in the developed and Sub-Saharan regions were compared, two distinct types of farming emerge:

1. The highly efficient farming which enables only a small number of farmers to feed a whole country.
2. The inefficient and low productivity farming which can sustain neither the farmer nor the urban populations.

For the majority of Africans subsistence agriculture on small plots is their way of life. Most farm families therefore still plan their output basically for their own subsistence. Family and village labour is the basic variable input in their agricultural systems. We can fairly say however, that the low productivity of these traditional subsistence systems is a result largely of a combination of three historical forces:

1. In spite of the presence of some unused and potentially cultivatable land, only small areas can be planted and weeded by a family at a time. This is done using traditional tools like the hoe, axe and panga. In some parts the Tse-Tse fly or the lack of fodder in extended dry seasons restricts the use of animal labour. Traditional farming must therefore rely on human labour to till small areas of land.
2. With regard to the above factor, the small areas of land tend to be intensively cultivated. They become subject to diminishing returns as labour inputs increase.

Shifting cultivation then becomes the most economic method of using limited labour on large areas of land. But shifting agriculture has broken down due to the fast increasing population densities on rural lands.

3. Labour becomes scarce for farm activity at the planting and weeding periods - the busiest part of the growing season. At other times, labour is underemployed. This can be explained thus: planting time is determined by the appearance of rains, yet much of Africa has only one extended rainy season, so, demand for workers in the early weeks of the rainy season exceeds all available rural labour supplies.

The combined effect of the above is the relatively constant farm total output and labour productivity through much of Africa. Its replacement - Sedentary (involving relatively less physical labour) cultivation, is practised on small owner-occupied plots. Instead, it increases the use of other non-human inputs and technologies especially in densely populated agricultural regions of Kenya, Uganda, Nigeria and Ghana. Moreover, with the growth of urban areas, the extension of the money economy, the soil erosion and deforestation of marginal lands and the introduction of land taxes, purely subsistence agriculture is no longer viable. There is need for greater mixed and modern commercial farming in Sub-Saharan Africa.

2.3. PRIORITIES FOR AGRICULTURAL TRANSFORMATION

The most important expectations from the agricultural sector are notably: To feed the growing population, to preserve the basic resources of the soil, water and stock varieties and even more important, to build upon the established local knowledge and management of these resources. Yet, if food supply is a fundamental requirement, the need to take account of fisheries and mineral exploitation cannot be ignored. Food and protein may be derived from the seas, lakes and rivers as well as small dams, ponds and fish farms. While mineral exploitation may (as in Nigeria) divert attention from agriculture, it may be of strategic significance in producing artificial fertiliser.

In general, three important propositions necessary for a people-oriented food agriculture in African may summarily be identified as:

2.3.1 Land Reforms

Although raising national agricultural production to self sufficiency levels is a necessary condition to resolve Africa's food crisis, it is not a sufficient one. A strategy aimed at reducing poverty by creating access of the poor to the most important productive resource of land is indispensable.

Landlessness is a growing problem in countries such as Ghana, Kenya and Malawi. In Zimbabwe, the unequal distribution of land explains why, despite large food surpluses of the 1980's almost half a million rural families still were vulnerable to malnutrition.²² A small farmer's attachment to his land is his innermost source of self esteem and freedom from coercion. It would become the impetus to small farmers for higher productivity and more efficient utilisation of resources (land and labour).

Land reform involves redistributing the ownership and/or use of land away from large owners in favour of cultivators with little or no land. This can be done by transferring ownership to tenants already working on the land, appropriating large estates for new settlement, as in Kenya; transferring land from large estates to small farms or rural cooperatives. Whatever mode the reforms take, their function is to transfer ownership or control of land directly or indirectly to those who actually work the land. However, land reforms alone are no guarantee against food shortages to the population, which leads to the next requirement.

2.3.2 Supportive Policies

Land reforms would be ineffective or Counterproductive if it did not relate to changes

²²Oxfam; Africa, Make or Break: Action for Recovery, 1993 (Pg. 30)

in institutions which control rural food production eg. seed and fertiliser distributors, banks and cooperatives. these ought to invest in poor rural farmers. In most African countries, poor farmers suffer because rural roads and irrigation concentrate in well-off commercial farming areas. In Kenya, Zimbabwe and Malawi, large-scale commercial farmers benefit from access to credit. Small producers are typically excluded from credit markets. this denies them access to fertiliser, seeds, oxen and farming implements on which productivity depends.

Public and private research generally favour better-resourced producers of commercial crops while the needs of small holders are ignored. The institutions and government policies ought therefore to serve the needs of the great population of poor rural farmers.

If the latter were favoured in the distribution of the hybrid miracle seed varieties, the irrigation, public credit, technical and educational services, storage and marketing facilities, rural infrastructure, then land reforms would yield higher productivity.

Equally required will be to provide incentives for small farmers in terms of pricing policies that truly reflect internal market conditions. Due to the monopolistic role of agricultural marketing boards, farmers are paid prices far below domestic or world free market prices. As a result, local food supplies fell far short of demand. Less government price interventions should therefore be preferred.

2.3.3 Technology and Innovation

Originally, many regions of Africa increased food production simply by extending the cultivation of unused but potential productive lands. today, this approach apparently is almost all exploited.²³ There is need therefore, for more appropriate technology. yet, when carefully examined, the problems associated with technology also imply a cautious introduction of the same for the transformation of food agriculture. Taking

²³Todaro M., (Pgs.319 - 320) This is because with low rates of population growth and densities, increasing the land area under cultivation was sufficient to increase food needs.

into account the Sub Saharan conditions, basically two sources of technology would increase farm output.

2.3.3.1 Mechanized Agriculture

Labour saving machinery such as large tractors would improve the crop output per worker, notably where land is extensively cultivated and labour is scarce. One man operating the combine harvester may, in one hour complete work done by hundred of workers using traditional methods. But the rural areas mostly have small plots, scarce capital and abundant labour. Such environment obviously creates more rural unemployment without necessarily reducing per unit costs of food production. In this way, rural poverty and unemployment - posing negative implications for household food security - are not alleviated. Also, if mechanised techniques exclude women, the male-female productivity gap could widen, with negative connotations.

2.3.3.2 Biological (hybrid seed), Water Control (irrigation) and Chemical (fertilisers, pesticides, insecticides, etc.) Innovations

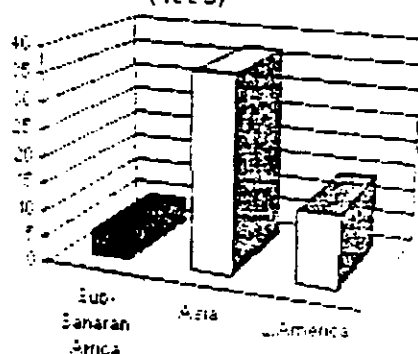
These are land augmenting i.e. they improve the quality of existing land by raising yield per acre. They are positively suited for tropical and sub-tropical conditions; do not necessarily require much capital or machinery; and they are scale-neutral in that they can equally be effective on large and small farms. But unfortunately, the institutions and policies which introduce the **Green Revolution**²⁴ into rural economies are NOT Scale-Neutral. Since hybrid seeds depend on applying adequate fertiliser, pesticides and irrigation, they are usable mostly by the rural elite farmers with access to credit, adequate land to make the investment profitable and agricultural extension services. The total costs thus involved to the rural subsistence farmer become greater than when traditional varieties are used. Otherwise, it is an approach with much potential to raise food output in the Sub-Saharan regions.

²⁴The term describing new seed varieties and technology intended to modernise third world agriculture.

Further still, in this connection, the potential role of irrigation in the region cannot be over-emphasised. Food production is almost entirely rainfed inspite of the highly variable and insufficient rainfall and droughts. For Sub-Saharan Africa in 1993, irrigated land as a percentage of total cultivated area was estimated at only 5% - See Fig. 2.²⁵ Irrigation potential in the region is estimated at 33 million hectares of which about 16% is currently utilised.

Fig. 2

Irrigated as % of Cultivated Area
(1993)



The need for expanding irrigation in Africa is therefore urgent. the major reasons for this include: the reliance on the highly variable and erratic rainfall, frequent severe droughts, rising population pressure accompanied by declining farm size and soil productivity, as well as land degradation and the existence of substantial, untapped irrigation potential. If irrigation were expanded, it will contribute to increased food production and security through:

i) Increased Productivity of Resources

Since food production in the region follows the rainfall seasons, production activities occur within 6 - 8 months only. If water were to be made available, production would or can be enhanced through double or multiple cropping thus raising resource productivity and total production. Research has revealed that,

²⁵FAO; Global Information and Early Warning Service, Commodities and Trade Division, EMail (Internet), Rome May, 1996 (Pg. 2:5)

ceteris paribus, yields on irrigated land in Sub-Saharan Africa average 3.5 times those from rainfed land.²⁶ This has important implications bearing in mind the almost 27.7 million hectares of unutilized land in the region. While realizing that full potential would be constrained by economic and technical factors, tapping even 10% of this potential can lead to full substitution of cereal imports.

Moreover, applying supplementary irrigation to rainfed crops minimizes the water stress caused by short dry spells, thus raising rainfed production also. Secondly, irrigation, besides meeting crop water requirements, increases the impact of other yield enhancing technologies, especially of fertiliser use. Controlled availability of water reduces the financial risk of using fertiliser inputs.

ii) Stabilizing Production

As food production in Africa is subject to interseasonal, rainfall induced fluctuation and recurrent droughts, improved irrigation would make food production more stable from year to year. This would enhance household and national food security and enable improved decision making in the process.

2.4 ADDITIONAL FACTORS FOR IMPROVED FOOD PRODUCTION

2.4.1 Livestock Farming in Sub-Saharan Africa includes the small mixed farming activity and that which is pastoralism. Although many donors and governments expect the disappearance of nomadic stock-keeping with future developments, this attitude is apparently misguided. Pastoralism makes productive use of environments unsuited for any other forms of agriculture, given current technology.²⁷ When pastoralists are displaced by crop producers, the activity of the latter generally are marginal, making them especially vulnerable to rainfall variations. The issue then is what can

²⁶Food Supply Situation and Crop Projects in Sub-Saharan Africa; Global Information and Early Warning Service - FAO - Rome Email (Internet); No.2/96, May 1996 (Pgs. 2 of 5 - 3 of 5)

²⁷Berg J. R. and Whitaker J. S., Strategies for African Development (Pgs. 201 - 202)

be done to improve its productivity.

African pastoralists know best about their type of herding such that scientific approaches from the developed world have grossly failed. This is because ranchers from the semi-arid East, are concerned solely with beef production and maximum returns on investment. Yet African pastoralists operate a dairy system meant to support the largest possible human population on the land and beef is only a side product. First, the problem of increased cattle and human populations implies ecological damage from overgrazing. It becomes more serious of a problem in the sense of **higher-than** economically optimal stocking levels. Herders sharing a common grazing area have the tendency as individuals to stock beyond the carrying capacity of that area.²⁸

The overgrazing problem was indirectly created or increased by past government efforts to assist pastoralists by providing new water points. Traditionally, although pastoralists considered the grazing range a common resource, they treated water points as property of well defined social groups. So, access to water determines whose livestock can use a particular section of the area. But the public water points necessarily had to breakdown this control mechanism. If the drilling of boreholes were done as a loan to specific social groups, then the traditional methods of ownership and grazing would be positively reinforced rather than undermined.

Secondly, is the problem of the weak markets for pastoralists. Although almost all of Africa's pastoralists see the primary function of their herds as providing for family subsistence needs, they are involved to some degree in long distance movement and sale of stock. In East Africa, the average pastoralism family needs about 30 - 35 adult cattle for subsistence.²⁹ So, trade in beef is possible when these requirements are exceeded. But the market problem becomes serious in drought periods. The

²⁸Jarvis, Lorell G. "Overgrazing and Range Degradation: Is There Need and scope for Government Control of Livestock Numbers?" Paper presented to conference on Livestock Policy Issues. International Livestock Centre for Africa, Addis Ababa, 1984 (Pg. 6)

²⁹Berg J. and Whitaker J. S. (Pg. 202)

prices offered for livestock are so low as to discourage even 'distress sales'. Grazing pressure on the fields is therefore increased. Also, the family's general calculation of stock needed in normal times to assure its survival in difficult times is raised. It would be appropriate if the state subsidised market outlets for drought periods both for welfare support as well as supporting the commercialization of pastoralism.

Thirdly, livestock diseases are a problem to pastoralists, of which they are keenly aware. At present, veterinary services would be more justified for preventive rather than curative treatment, given the economics of pastoral production. Since prevention and control of outbreaks cannot be easily viable for private practice, medicine for pastoralists ought to be provided by the State.

2.4.2 Human Resource Capacity

It would be significant to note that Africa is at the bottom of the human resource scale in the third world. The region's literacy rates, percentage of school age population in secondary schools and agricultural institutions, experts in scientific, managerial and academic staff positions are lowest. In 1980, the stock of human capital in scientific fields per million people in Africa was about only a quarter of the relative scientific strength of Asia in 1970.³⁰

This situation is compounded by the regular brain drain of African experts who would contribute to the food sector in Sub-Saharan countries. The need here is that the major donors should respond to these human resource problems. Projects to support undergraduate and degree programs in agriculture have the potential to yield results in the long term. Incentives to support experts ought to be undertaken to improve crop varieties, livestock herds, spraying and other biological capital investments.

2.4.3 Uplifting Women Performance in Food Production

³⁰Berge J. and Whitaker S. (Pgs. 253 - 254)

African women do nearly all the tasks associated with subsistence food production.³¹ These include removing and burning felled trees, sowing, weeding and preparing the crop for storage or consumption. Such tasks are performed with the most primitive tools, requiring long and hard labour to produce only the family subsistence food. Housework for the women means hauling water over long distances, gathering heavy loads of firewood and washing clothes in streams; food preparation would include hours of pounding and grinding grain; child care involves caring for several children and infants simultaneously. The burden of work borne by women in producing food is particularly due to relative inefficiency with which they must work, without capital and technology. yet, almost no effort is made to improve their productivity.

Men, on the contrary, usually have access to credit and learning modern methods of production. It is therefore imperative to assist women in this regard, given the major role played by them in food production. Oxfam's experience with loan funds and credit support systems is that low income women throughout Africa are reliable borrowers and are willing to take risks.³² Besides credit, to them for food production, they would also deserve assistance in food storage and transport systems

To conclude this chapter, two positions may be quite revealing. First, the World Bank has officially noted that global food production grew faster than the population growth within the past 40 years. It was confirmation that the economic resources and technical means exist to increase food production even in the future. On the contrary, a study by the International Institute for Applied Systems Analysis presents a cautious position: increasing the food supplies on world markets would have practically no impact on hunger in the developing countries such as those of Sub-Saharan Africa. Therefore, the problem essentially remains: How can food entitlement be increased, especially the purchasing power of groups without enough to feed on?³³

³¹Infact, estimated at 70% -80% of all the tasks.

³²Oxfam; Africa, Make or Break: Action for Recovery, Zimbabwe, 1993. (Pgs. 29 - 32)

³³Solon L. Barraclough; An End to Hunger ... UNRSD, 1991 (Pgs. 2 - 5)

CHAPTER 3.0 FOOD SECURITY - An Overview

Food security can be defined as sustained and assured access by all social groups and individuals to food which is quantitatively and qualitatively adequate for their nutritional needs.³⁴ For this end, a food system offering security should have:

- The capacity to produce, store, import and distribute sufficient food for the basic needs for all groups; the system should be dependable to all.
- Autonomy and self determination - able to reduce political pressures and international market fluctuations.
- Reliability, in that seasonal and other variations in food accessibility are minimal.
- Sustainability, such that the ecological system is protected and improved in the process.

As a policy goal, food security means that food policies of African governments and donors should not be limited to food production per se. They should include policies to help the rural and urban people to increase their incomes and access to a reliable supply of food at all times. but the political and technical support for this policy goals will take time.³⁵

³⁴Ibid - (introductory part)

³⁵Berg J. R. and Whitaker J. S. (Eds), *Strategies for African Development*. (Pgs.257 - 258)

Table 3 - The Average Calorie Supply per Head per Day - 1961 -1190³⁶

Year	Calories	Protein	Fat
1961-1970	2197.47	64.61	35.15
1971-1980	2235.56	62.38	38.2
1981-1990	2089.02	56.02	42.5

Source: Sofats, 1993

Assuming the standard minimum calories per adult is 2500 per day, Table 3 above in general, reflects less than minimum figures for standard nutritional scales. Kenya's production and importation of food stuffs over the years had 2285.9 calories per head per day as highest in 1977; the lowest, 2028 in 1984.³⁷ We also notice a gradual decline (since 1977) in calorie supply per head from the 3 decade averages in the table. This affirms that a substantial part of Kenya's population consumes less than standard calories for the normal adult. Kenya's calorie supply, given the maldistribution of foodstuffs among the population, is insufficient to feed its population. For purpose of specificity, focus shall be made upon the cereals sector in Kenya, particularly within the recent past.

3.1 KENYA'S CEREALS SECTOR: A CASE STUDY FOR FOOD SECURITY

3.1.1 The Maize Sub-Sector

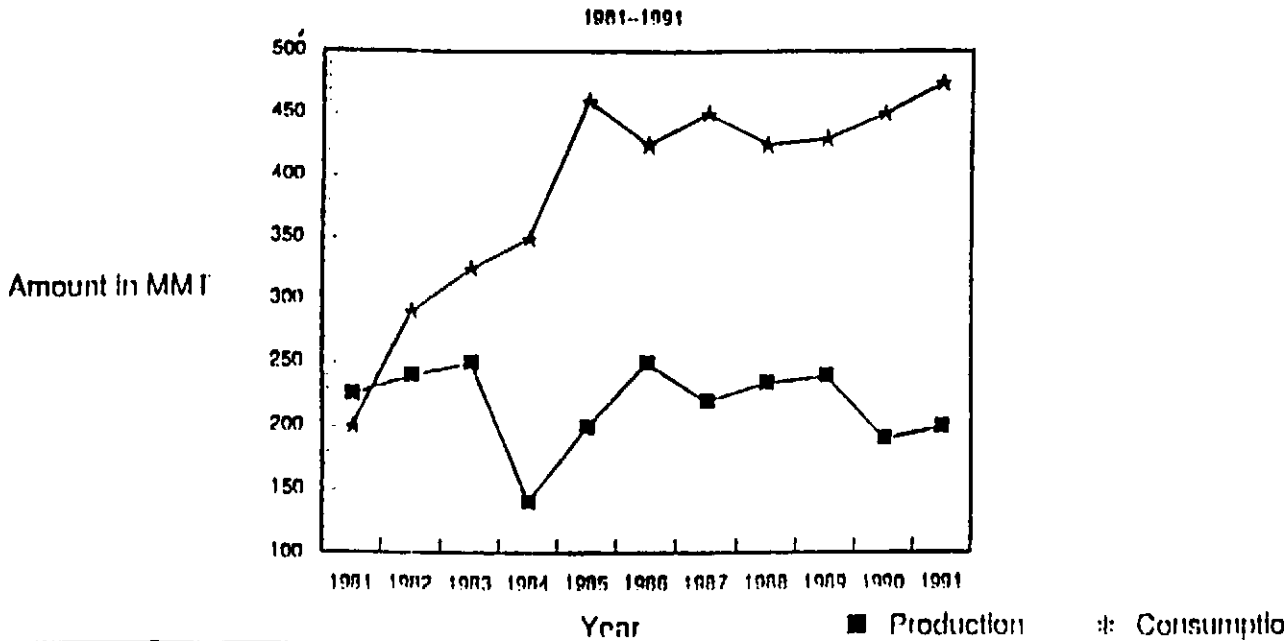
Basically, Kenya's production of cereals does not match domestic consumption requirements for most grains. First, in the 1960s and 1970s, maize adequately met

³⁶SOFATS; The State of Food and Agriculture; FAO, Rome 1993 (Pg.9)

³⁷Waweru Daniel; The Food Situation in Kenya - Analysis Paper written in 1996 (Missionary Benedictine, Limuru, Kenya) - (Pg.6)

domestic needs due to area and yield expansions.³⁸ But for most of the last decade, consumption needs were not met - Fig. 3³⁹. Production fluctuated and for drought reasons, 1980- 1984 had a major fall. Since 1990, production is estimated to have declined by about 7% mainly as result of declining yields.

Figure 3 : Maize production and consumption



From 1990 to date, decline in maize production can be seen mainly as a product of two factors: distorted price incentives and environmental factors. In Kenya, the maize sub-sector is controlled in terms of pricing and distribution. In fact, it still remains to be seen whether the lifting of controls on domestic marketing, imports and distribution recently is genuine. Often, gain for a few powerful individuals and political interest tend to control pricing and distribution functions. Kenya's maize imports, which have risen since 1990 can be substantially reversed to positive domestic production with appropriate producer incentives.

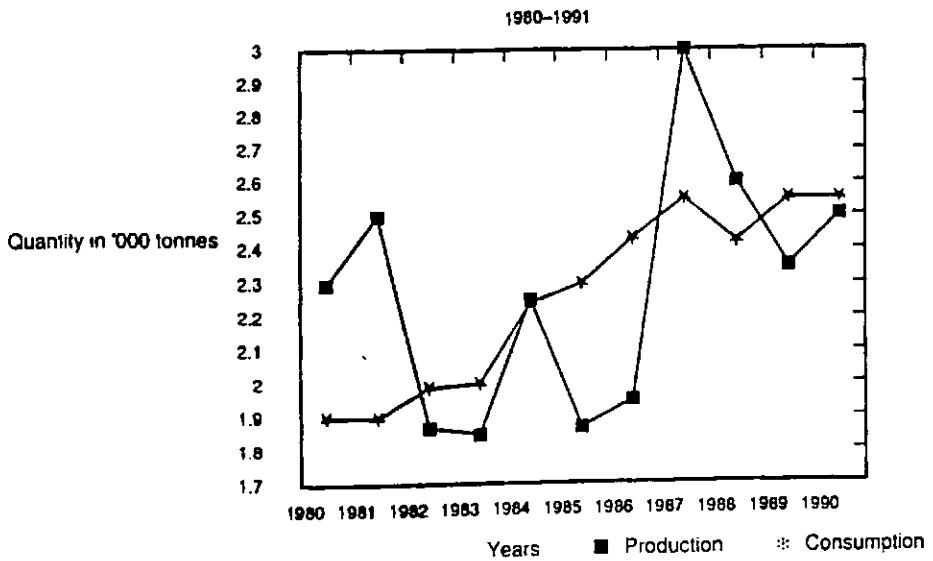
³⁸World Bank; Agricultural Growth Prospects and Strategy Options, 1990 (Pg.7)

³⁹GOK; Agenda '94, People, Economic Affairs and Politics, PEAP, NBI, 1994 (Pg.138)

3.1.2 The Wheat Sub-Sector

Kenya produces less than half its domestic wheat requirements because of static acreage and low yields. On average, Kenya produces slightly above 200,000 tonnes of wheat annually against a consumption requirement in excess of 500,000 tonnes. Fig. 4 summarises domestic wheat production and consumption for the period 1980-1991. 50% of Kenya's wheat requirements is imported to meet shortfalls in domestic output. Early 1993, all import controls were removed and consumer prices for wheat and wheat products were liberalised. Cheaper wheat imports would necessarily stifle domestic production. But given Kenya's relatively low wheat productivity (due to less yielding varieties), wheat is less expensive to import than produce.

Figure 4: Wheat production and consumption



3.1.3 The Rice Sub-Sector

The rice sub-sector also produces insufficient quantities to meet domestic needs. Rice production has stagnated at between 30,000 and 40,000 tonnes annually. Yet, consumption requirements is placed at about 80,000 tonnes. Stagnation in output is mainly due to minimal expansion of area under its cultivation, plus low yields. About 13,000 hectares of both irrigated and rainfed production make up the rice fields.

These have an average yield of about 4.5 tonnes per hectare. Imports are liberalised and about 45,000 - 50,000 tonnes have been imported into Kenya over the past several years.

3.1.4 The Beans Sub-Sector

The entire domestic bean production is consumed locally. Estimates for annual domestic consumption are in the region of 40,000 tonnes. A decline, estimated at about half the annual demand occurred in 1990 - 1991. In fact, 1987 onwards carried a falling production to 270,000 tonnes in 1988; a slight increase to 285,000 tonnes (1989), dropped to 231,000 (1990) and a further fall to 210,000 tonnes in 1991. the decline - a result of diseases, unfavourable weather conditions and low usage of certified seeds and other inputs - indicated deficit.⁴⁰ More contribution is expected of the beans sub-sector since it was decontrolled in January 1992.

Given the above analysis of the cereals sector, the present challenge is how to reverse production trends and boost domestic output and farmers incomes. Unfortunately, while Kenya can increase cereals output and achieve a reasonable standard of food security, there remain bottlenecks. From the 1980s, Kenya has become a grain-cereals deficit country. the cropped area has not expanded in general, yields have fallen, and production has not matched population growth. Traditional political controls on distribution and availability of cereals persist. Rising consumer prices relative to declining real consumer incomes is practically countrywide. the combined effect of these has become a declining consumption per capita from about 108kg. in 1980 to 90kg in 1990/91 of the maize staple. Known to provide 44% of the calories per capita per day, its decreased availability affects negatively the nutritional status of the population.

⁴⁰Ibid

3.2 FOOD SECURITY PROBLEMS IN THE CEREALS SECTOR OF KENYA

The main problems have been identified as revolving around private commercial interests stifling public ones, regressive government policies, management issues, political interference and poor decision making.⁴¹

Notably, conflict occurs between private interests and good policy administration. The policy making officials often are known to have milling and trading interests in cereals. Private considerations hence often tend to determine policy rather than the interest of the sector growth.

Poor quality seed, for instance is cited as a result of such conflict. In the seed sector, Kenya Agricultural Research Institute (KARI), researchers, on, breeds and develops suitable maize strains. These are multiplied by Kenya Seed Company (KSC) through agents like the Agricultural Development Corporation (ADC) and other contract farmers, and distributes them for commercial growing. However, Kenya Seed Company's management and that of Kenya Agricultural Research Institute share a common chairmanship. The Head of ADC, which produces seed for KSC, together with the joint chairman, hold major private production interests which necessarily must clash with their public roles. Strict quality control in seed production therefore becomes a defeated goal.

The National Cereals and Produce Board (NCPB) is also manipulated continually by a few political and powerful figures in setting of domestic prices and import policies. For instance, prior to a recent price review of maize, traders could gain greatly in buying grain and re-selling it back to NCPB. Individuals also act as brokers between NCPB and millers, buying maize below the official price from NCPB and then selling it at depot price to millers and gaining the difference.

⁴¹GOK; Agenda '94. People, Economic Affairs ... (Pgs.142 - 145)

Maize distribution in the country has been known to be politically controlled through NCPB in an uncoordinated way. For example, the government in February 1992 allowed free movement of every 88 bags of maize. But Provincial Administration still prevented private participation in the grain trade. When in October 1992, the ban on maize movement was reintroduced, serious price instabilities were created.

Market controls also prevent the Board's aim of providing grain on the market at reasonable prices. In most rural areas of Kenya, price instability results from movement and price controls. Such restrictions often cause high marketing costs and shortages especially in deficit areas. Also when maize flow is dictated by politics rather than economic and social considerations, the Board's mandate to promote nutritional welfare of the population fails.

In addition, the ministries which set producer prices do so basing on a common cost of production. The result is a uniform price for all regions, despite variations in production technology. Eventually, 'artificial prices' in certain regions of Kenya result. Secondly, producer prices tend to be announced with wrong timing. Ideally, these ought to be known to farmers before planting begins in order to influence planting decisions. Often, they are declared too late to influence such decisions.

Fertilizer supply, distribution and use tends to be affected by uncertainty in decisions of government. In 1990, when government decontrolled (liberalised) fertiliser prices, they fell by about 18%,⁴² badly affecting fertilizer distributors and agents. Rising inflation, high interest rates and devaluation of the shilling have also recently caused uncertainty about the profitability of importing and distributing fertiliser. Inevitably, these problems affect the timely availability and use of fertiliser by farmers.

Finally, drought and the current 3.7% population growth rate certainly threaten the sustainability of present land use. Adverse weather and ecological conditions, especially of 1984-1985 and 1992-1994, were crucial problems for food security in

⁴²Agenda '94: People, Economic Affairs and Politics (PEAP), NBI, 1994 (Pgs.145 - 147)

many districts. Drought reduces the productive potential of land within a short period. And then, with less food and forage, the remaining vegetation is often over exploited.

3.3 PURSUING FOOD SECURITY IN THE CEREALS SECTOR

In context of the foregoing cereals problem-analysis, food security becomes an elusive goal. The following therefore are a selection of proposals which can be decisive to food security for Kenya's population.

- 3.3.1** The cereals sector to be gradually liberalised. The issues to address here include: the vetting of managerial appointments in the grains sector by parliament; scrapping government monopoly of seed production and marketing; the market mechanism to determine prices of grain; grain parastatals like NCPB, KSC etc., which are loss-making should be sold off; cessation of political interventions in the grain sector; farmers to form their organisations and sell grain direct to millers and consumers rather than to NCPB.
- 3.3.2** Individual and household incomes are the main assurance of food security to kenyans, as for any other nation. It is in the creation of economic incentives (an enabling environment) which encourage income generating activities that the major challenge lies in the next 3-6 years. the ways in which incomes can be increased are beyond the scope of this paper. But documents such as the government's Sessional Paper No.1 of 1986 lay out how this can be done for Kenya. Yet such plans are yet to be carried out.
- 3.3.3** The presenting issues in Kenya's food security are medium term ie. 3-6 years. Interventions such as technology development, investment in infrastructure and credit facility for small holder grain farmers would make a positive difference. For farmers to succeed in increasing food output, a system of appropriate technology that provides them with inputs and information, necessary to enhance productivity is required. If the green revolution were to be boosted, land reforms would be as essential as access

to inputs like fertilizer, good quality seed, right prices policies and market information to rural farmers particularly.

3.3.4 The Trade Regime of Kenya would be such that it takes into account the positive role of grain imports from regional neighbours. Imports, however may destabilise prices in the country. This requires that efficient Kenyan producers are protected from subsidized grain imports.

3.3.5 Interventions whose impacts are felt over the long term include Research, Education and Human Capacity Development which would improve incomes of people; family planning to reduce the number of mouths to be fed by households; and natural resource/environment conservation to protect resources from which future food supplies are to be produced. Kenya's regions would reduce the negative impacts (on people and environment) of drought, famine and land degradation depending on the existence of an early warning system and the coping mechanisms of local communities. Machakos District, where population has increased four fold in the last 50 years, has had good success in land husbandry practices.

To pre-empt adverse famines, the causes of food shortages in Kenya need to be understood. The ones that can be predicted should be determined. That means, how does a community obtain its food, who is most vulnerable, and what is the level below which distribution channels may be considered to have failed? From this, course of action can be determined to reduce or eliminate the constraints. Finally, storage systems countrywide for cereals need to be improved, as in many cases, poor storage standards may account for losses in food, thus loss in calorie supply to households.

CONCLUSION

Sub-Saharan nations are faced with several tough questions for their food security: How can food production be increased on rainfed and irrigated land? What role should international trade play in achieving an assured food supply - especially for urban consumers? What are the interactions between short-run and long run policies to achieve food security? How can urban consumption be diverted more from imported foods to locally produced traditional ones? How will food import bills be paid?

In implementing food security policies, governments will have to face competing objectives. These involve price incentives to farmers for higher output, at the same time protect urban consumers from higher food prices. Besides this, the difficulty of developing private trade in the food sector after years of state marketing will certainly be a challenge to resolve.

At present, agricultural research and early warning systems, infrastructural, food import and distribution programs, as well as domestic production and storage standards are generally weak. Almost no appropriate crop technology is generated from research facilities. This experience of Sub-Saharan regions demonstrates the fallacies of depending almost totally on pricing policy to increase food production both in the long and short terms. It is not sufficient.

It will be fair to say that given the population and poverty problems typical of sub-saharan regions, intensive small holder, organic and inorganic mixed farming should form a basis for food security strategies for the 1990s. Unless low-productivity peasant agriculture is rapidly transformed, the increasingly impoverished and landless rural populations face grim prospects to survive, even in the near future.

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