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Developing a SADCC Food and Agriculture Strategy:
Objectives, Components and Process*
by

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WITHDRAWN

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Developing A SADCC Food and Agriculture Strategy:
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Carl K. Eicher and Mandivamba Rukuni

I. INTRODUCTION

We are pleased to be invited to discuss the practical steps that can be taken by SADCC to develop a more comprehensive food and agriculture strategy.^{1/} The task is a logical follow-up to SADCC's path-breaking Macro Economic Survey, 1986.

There is common agreement that the food and agriculture sectors carry a heavy burden in the economic structure and future destiny of the SADCC region. Simple mathematics tell the story. The population of the region is growing by around two million per year. Fifty to eighty percent of the population and labor force are dependent on agriculture for employment and income. It follows that raising the productivity of agriculture is a sine qua non for raising the standard of living of the average person in the region.

We have made three assumptions in preparing this paper, First, we assume that there is a consensus that SADCC should supplement its agricultural program with a more comprehensive strategy. Second, we assume that SADCC would like to have Interim or final Strategy ready in 3 to 6 months. Third, we assume that the finished product should have a tangible outcome for member states, ie., a framework that will assist in speeding the flow of donor funds to finance more regional food and agriculture projects, and national projects with a

^{1/} Because of our lack of knowledge of SADCC programs in Fisheries, Forestry, Wildlife and Soil and Water Conservation, we have not devoted adequate attention to these important sub-sectors.

regional impact. The challenge is to figure out how comprehensive the strategy should be, and what can be achieved in 3 to 6 months. We should keep in mind that SADCC Agriculture: Toward 2000 (FAO, 1984) was completed by a task force in six months but the report is shallow and has been overtaken by events.^{1/}

We shall address the objectives, components and the process of developing a more comprehensive SADCC food and agriculture strategy. We begin by raising several fundamental questions:

- * Should SADCC replace regional food self sufficiency with a goal of regional food security?^{2/}
- * What should be the objectives of a SADCC Food and Agriculture Strategy?
- * What should be the time period of SADCC's Food and Agriculture strategy? Five years? Ten years? Until year 2000?
- * What data, human and financial resources, and member state contributions are necessary to produce a more comprehensive food and agriculture strategy?
- * Who will oversee the implementation of a comprehensive SADCC Food and Agriculture Strategy?

These complex questions are highly interdependent and have no set answer. Each should be addressed separately and collectively.

^{1/} See Eicher and Mangwiro (1986) for a critique of the FAO report.

^{2/} The World Bank recently released a food security policy paper entitled Poverty and Hunger. Food security was defined as "access by all people at all times to enough food for an active, healthy life." Two essential elements are the availability of food and the ability to acquire it" (World Bank, 1986, p.1).

II. CORE PROBLEMS

Good harvests in 1985 and 1986 have dramatically changed the short term food outlook in the SADCC region. But beneath this welcome turn of events are four long-term problems:

- * Food production-population race,
- * Lack of jobs in rural areas
- * Pervasive poverty, malnutrition and food insecurity
- * Need for agricultural diversification and rural industrialization.

Unfortunately, much of the conventional wisdom on how to tackle these problems is based on a shallow understanding of the complex nature of the food and agricultural crisis and a tendency to oversell one or two of the prime movers of agricultural change (e.g., policy reform or new technology). There is also a tendency to address these long-term problems with three to five year projects. Most African states and donors have underestimated the 10 to 20 year gestation period required to develop human capital, managerial and financial skills, and help Faculties of Agriculture develop a capacity to train students at the post-graduate level in the region. We shall briefly examine these problems:

The Food Production-Population Race

The starting point for understanding the food production-population race is the rate of population growth - not the population density or the total size of a nation's population. The current population growth rates in Africa - 2.5 to 4.1 percent - are extremely high by historical standards and imply a population

doubling time of 15 to 25 years. For example, Africa's current 3.2 percent annual population growth rate is roughly triple the rate of growth in some industrial countries at a comparable stage of their economic history. For example, the annual population growth rate in numerous European countries from 1850 to 1900 was around 1.0 percent and 1.1 percent in Japan from 1878 to 1912.

Rapid population growth is increasing the pressure on food supplies and the natural resource base, including fisheries, game parks and grazing land for wildlife and livestock. In many SADCC states, population and income growth will generate food needs requiring food output to grow at 4 to 5 percent per year, an awesome task in light of historical evidence.^{1/} This explains why the efficient expansion of food production is one of the cornerstones of a regional food security strategy for SADCC states. Food aid can help to fill the food gap as it did in India for 15 years, 1956-71. But in the final analysis, SADCC states must deliver on the food production front.

Lack of Jobs in Rural Areas

Seven out of ten people are living in rural areas in the SADCC region. And in year 2000, the majority of the people will still be in rural areas because of the stark inability of the industrial, urban and service sectors to generate adequate jobs. For example,

1/ The historical record shows that only a few countries have sustained 3-4 percent annual growth rates of food production for a decade or more. Moreover, only a few countries have achieved and sustained 4-5 percent growth rates for the agricultural sector as a whole for a decade or more. For example, over the eighty year period - 1880 to 1960 - the annual compound rate of growth of agricultural output was 1.5 percent in the U.S. and 1.6 percent in the Japan (Hayemi and Ruttan, 1971, p.113).

in the 22 low income countries in Africa the labor force in agriculture fell by only six percent (84 to 78) over a sixteen year period - 1965 to 1981 (World Bank, 1985, p.214).

There is growing evidence that rural employment generation will be as important a challenge to SADCC states in the 1990s as expanding food production has been during the 1980s. For example, in Zimbabwe's 1986-90 Development Plan, rural employment generation is being given high priority because roughly 85,000 school leavers have been added to the labor force for each of the past three years (Zimbabwe, 1986 p.6.). It is estimated that only about 6,000 of the 85,000 school leavers in 1986 will find jobs in the industrial and services sectors. Finding productive employment for the remainder in farming and rural nonfarm activities is a major challenge .

SADCC's food and agriculture strategy should address the following issue: What can be done to help school leavers find productive employment in agriculture and rural nonfarm activities for a generation or more until fertility rates start to decline? In a crude sense, how can people be "parked" in agriculture to produce their own subsistence food needs until fertility rates turn downward? This challenge requires far-reaching programs to bring more land under cultivation, promote market towns, nationwide rural electrification grids, employment-intensive industries and long-term "Maize for Work" or "Cash for Work" programs with the dual objectives of providing seasonal jobs and developing rural infrastructure.

Poverty, Malnutrition and Food Insecurity

The FAO estimates that about one-fourth of the people in Africa

were hungry and malnourished in 1985. Until the past decade, it was commonly assumed that the lack of protein was the dominant cause of malnutrition. But research has shown that the key to good nutrition is getting enough calories because the protein needs of most people will be met if they consume enough calories from several sources. Pregnant and nursing women, however, usually need additional protein. Poverty is a major cause of malnutrition because it prevents people from producing or purchasing a calorie-adequate diet. Research has shown that hunger, malnutrition and food insecurity in rural areas are primarily caused by one or more of the following;

- * a lack of access to land for families to produce adequate food,
- * low productivity of family labor on subsistence farms,
- * drought-induced instability of food production
- * poverty prevents families from purchasing adequate food on a timely basis.

SADCC should adopt a clear definition of food security and distinguish it from food self-sufficiency and food self-reliance. Although the concepts of food self-reliance and food self-sufficiency have powerful emotional and political appeal, they are of questionable operational value to SADCC because they have a built in food production bias.^{1/}

Food security can be defined as ensuring that all members of society have access to a calorie - adequate diet throughout the year. The key elements of a food security strategy are the

^{1/} Five food concepts are defined and reviewed in Annex A.

availability of food (through domestic production, storage or imports) and access to food through home production, purchase in the market, food for work programs or food grants. There is now substantial empirical evidence that expanded food production by itself will neither eliminate hunger nor malnutrition nor food insecurity. For example, India is self-sufficient in basic food grains and it donated food aid to Ethiopia in 1985. But because of poverty and landlessness, an estimated 30 to 40 percent of the people in India do not have access to a calorie-adequate diet.

The message for SADCC is clear. Food production research and food production projects are important but insufficient vehicles for solving malnutrition and food insecurity problems in the SADCC region. The reduction of poverty is a central part of a strategy to reduce food insecurity and malnutrition. Rural income and employment generation, food aid, and school feeding and public works programs are important components of a strategy to tackle malnutrition and food insecurity.

Botswana's success in providing some supplementary food to approximately sixty percent of its total population at some time during the year is one of the best kept secrets in Africa. Botswana, in our judgment, is the model country in Africa in facing up to hunger, malnutrition and food insecurity among rural people. Other SADCC countries can learn from Botswana's experience in developing a set of policies, programs, projects and local, district and national institutions to ensure that all people have access to a calorie-adequate diet.^{1/} But the most important lesson

^{1/} For a recent assessment of Botswana's experience see Holm and Morgan (1985).

is political not administrative. Botswana has made a powerful political commitment to plan and implement policies and programs to help the poor, the unemployed and the destitute increase their access to a calorie-adequate diet throughout the year.^{1/}

Need for Agricultural Diversification
and Rural Industrialization

Many SADCC states have the potential of meeting the basic grain needs of their people in the foreseeable future. We believe that agricultural diversification away from cereals is desirable and an inevitable long term process. A substantial long term investment in agricultural research is required in order to lay the foundation for the gradual diversification of SADCC's agricultural economy away from grain. The research investment should be broadly allocated to plant breeding, agronomy, irrigation, food science, food processing and agro-industry

We are of the opinion that SADCC Ministers of Agriculture should provide leadership in stimulating debate and developing agricultural diversification and rural industrialization strategies. The development of such strategies requires the joint cooperation between the SADCC countries responsible for the industrial and agricultural portfolios. The challenge is to develop projects that can spread capital over employment-intensive industries in rural areas.

Some work is underway on finding new uses for sorghum in the region. The SADCC/ICRISAT Sorghum and Millet Research Center at

^{1/} Research on household food security should be stepped up - see Eicher (1986) and Rukuni (1986).

the Matopos station in Zimbabwe is reviewing the present sorghum surplus in Zimbabwe and potential surpluses in other countries in the region. ICRISAT/India has recently made US\$150,000 available to the Director of the SADCC/ICRISAT Center to undertake a preliminary assessment of the implications of sorghum surpluses in India, China and Zimbabwe for sorghum plant breeding strategies for ICRISAT worldwide. Basically the question posed is: What are potential new uses of sorghum in the SADCC region ten to fifteen years down the road and how can these uses be factored into ICRISAT/SADCC's present breeding strategies?^{1/}

It takes a decade, on the average, to produce and farmer-test new varieties for crop diversification. SADCC should plan its agricultural research and human capital strategy to meet the needs of a changing regional economy in 1995 and year 2000. For example, should SADCC be planning a \$20 to 30 million regional fruit and vegetable research program? Should SADCC invest in research on jojoba, nitrogen-fixing trees and some of the thousands of different fruit species not in commercial production. Vietmeyer (1986) reports that of 3000 different species in Africa, Asia, Latin America, the Carribean and the Pacific "only four - bananas, pineapple, papaya and mango - have been developed into major crops" (p. 1381).

^{1/} Examples include blending white sorghum with wheat to make bread, lager beer, convenience foods like sorghum chips, animal feed, and industrial uses such paints, plastics etc. Research by Dr. Gomez, University of Zimbabwe food scientist, shows that up to 15 percent of white sorghum can be blended with wheat flour in making bread. Research on composite flour should be of interest to SADCC because almost all SADCC states import some or wheat flour wheat from outside the SADCC region.

In summary, SADCC's Agricultural Research Committee should pose the question: What are the strategic long run investments in basic science, post-graduate training, applied research, and infrastructure to accelerate agricultural diversification and rural industrialization over the next 10 to 15 years?

III. PRIME MOVERS OF AGRICULTURAL DEVELOPMENT

Before we turn to an examination of the seven sub-sectors in SADCC's food and agricultural strategy, it is important to have a clear understanding of the prime movers of agricultural development and to compare SADCC's strategy with this package of prime movers. Experience has shown that no single prime mover - i.e new technology, or higher prices - can increase aggregate farm production and sustain it for any period of time. No amount of political will, policy reform, or change in relative prices of one commodity can increase the rate of growth of agricultural output and sustain it over a period of several decades. Instead SADCC states and donors should focus on the prime movers of agricultural development as a policy package:

1. Bringing more land under cultivation.
2. New technology that is produced by public and private investments in agricultural research.
3. Human capital and managerial skills that are produced by investments in schools, training centers, and on-the-job experience.
4. Accretionary growth of biological capital investments (e.g., improving livestock herds) and physical capital investment in infrastructure such as dams, irrigation, and roads.
5. Improvement in the performance of institutions such as marketing, credit and national agricultural research and extension services.
6. Favorable economic policy environment.

A significant characteristic of prime movers 2-5 is their long gestation period (10 to 25 years). For example, experience has shown that it takes around ten years of research, on the average, to produce a new plant variety, and another five to eight years to gain widespread farmer adoption. It takes ten to fifteen years of post graduate study and on-the-job training for an agricultural research scientist to be productive. It takes several decades or more to develop irrigation and water management planning capacity in countries with little experience with irrigation and a decade or more to help farmers develop efficient farmer irrigation associations (Rukuni, 1984). However, most donors are avoiding long gestation (10 to 20 year) investments to develop indigenous scientific, managerial and technical capacity in the SADCC region.

IV. Objectives of SADCC's Food and Agriculture Strategy

From this overview of demographic forces and problems emerges the need for a SADCC food and agriculture strategy to satisfy seven basic objectives:

1. Provide a framework to integrate SADCC's regional projects with national projects with a regional impact and harmonize investments that cut across sectors - e.g. agro-industry and human capital improvement projects.
2. Efficient growth of food and agricultural production among member states.
3. Efficient utilization, protection and conservation of natural resources.
4. Rural income and employment generation

5. Ensuring a calorie-adequate and nutritious diet for all members of society.^{1/}
6. Adequate national and regional food security to ensure against bad harvests, natural disaster and uncertain food supplies in the world economy.^{1/}
7. Generation of domestic savings and foreign exchange to finance a gradual structural transformation of agricultural-dominated economies to those producing a larger percentage of industrial goods and services.

V. COMPONENTS OF A COMPREHENSIVE
SADCC FOOD AND AGRICULTURE STRATEGY

The Lusaka Summit in April 1980 authorized SADCC member states to develop and coordinate regional programs for seven food and agriculture sub-sectors:

- | | |
|--|------------|
| 1. Food Security | - Zimbabwe |
| 2. Agricultural Research | - Botswana |
| 3. Livestock Production and Animal
Disease Control | - Botswana |
| 4. Soil and Water Conservation and
Land Utilization | - Lesotho |
| 5. Fisheries | - Malawi |
| 6. Wildlife | - Malawi |
| 7. Forestry | - Malawi |

Essentially these seven sub-sectors represent a partial food and agriculture strategy. In 1980, SADCC was understandably concerned with three major issues: 1) food (food security, agricultural research and food production), 2) livestock and 3) natural resources (soil and water conservation, fisheries, wildlife and forestry).

^{1/} Note - if objectives 5 and 6 are endorsed, it commits SADCC to a goal of regional food security - not regional self-sufficiency in food production.

But the following investment activities are not included in SADCC's partial food and agriculture strategy:

1. Human capital improvement in the agricultural sector, including technical schools and Faculties of agriculture and Faculties of Science.
2. Agricultural research on industrial crops and export crops such as tea, confectionary groundnuts, horticultural products etc.
3. Agro-industries such as fertilizer and food processing plants.

Experience in Asia over the past decade has shown that large public investments in agricultural research (broadly defined to include food, livestock, industrial, and export commodities), post-graduate education in agriculture and science, rural roads, and rural electrification were crucial to the success of agriculture and employment led growth strategies. For example, as the dominant cereal needs of Asian societies were met, the agricultural research priorities shifted to support crop and livestock diversification strategies, including dairy production, fruits, vegetables and poultry. This experience should be factored into SADCC's expanded food and agriculture strategy.

The stock of human capital in scientific fields per million people in Africa in 1980 was about one-fourth the relative scientific strength of Asia in 1970 (Shapiro, 1985). Kenneth King of the University of Edinburgh recently assessed the status of human capital in Africa and concluded that:

"many of the scientific careers where Africa offers opportunities are still dominated by white science. Rangeland management, ecology, archaeology, palaeontology, renewable energy, mining and specialized agricultural research are only a few of the fields where technological capability is predominantly in expatriate hands" (King, 1986, p.426).

It is obvious that human capital improvement should be given major attention in SADCC's expanded food and agriculture strategy. Should Ministers of Agriculture take the lead in laying out a framework for a 20 year program of strengthening post graduate training in Faculties of Agriculture in the region? A price tag of \$40 to 50 million for the first ten years of such a program would require sustained support from several major donors and unparalleled donor coordination.

In summary, SADCC needs to consider investments in the following:

- * Basic science research in support of agriculture and agro-industry^{1/}
- * Human resources - post graduate education in agriculture and scientific fields in support of agriculture such as biochemistry, chemistry, engineering and food science
- * Agro industry
- * Rural transportation networks^{2/}
- * Energy (ie. rural electrification).

In summary, there is no set answer on what components should be included in SADCC's food and agricultural strategy. Much depends on

^{1/} The modest donor investment in basic science research in African universities and research institutes can be described as "the basic science gamble"; it assumes that international technology transfer and applied research (eg. farming systems research) are adequate to solve the problems of African agriculture (Eicher, 1986a).

^{2/} IPRI reports that rural transport costs per ton mile in some African countries are twice as high as in Asia, thus contributing to higher food marketing costs in Africa.

SADCC's objectives for food and agriculture. We strongly recommend replacing the objective of regional self-sufficiency in food production with regional food security.

VI. PREPARING A FOOD AND AGRICULTURAL STRATEGY

Eicher and Mangwiro (1986) have highlighted the data, budgetary and human capital requirements and methodological problems in preparing agricultural sector strategies. In light of the complexity of the task, we suggest that SADCC prepare an interim strategy over the next four or five months covering the 1987-89 period followed by the preparation of a a long-term strategy for 1990-2000.

An Interim Food and Agriculture strategy should be prepared through the active participation of a wide range of SADCC public officials, scientists and policy makers. The challenge over the next four to five months is to carry out an intensive review of each of the seven sub-sectors. The aim is to review, consolidate and streamline sub-sector portfolios and to develop the bare bones of an interim strategy for each sector, including a list of possible "Second Generation" projects. The interim strategy would be based on present data sets and intuition and it would be a descriptive plan for the future. A team of four broad-guaged professionals - agricultural economist, crops specialist, animal scientist, natural resource specialist - could synthesize the deliberations of the various sub-sector committees and prepare a brief document of about 40 pages in one month.^{1/}

^{1/} The team preparing the Interim Strategy in November/December 1986 should include detailed terms of reference for the long term strategy exercise, including a list of analytical studies to be pursued in 1987 and 1988.

Turning to the preparation of the long term strategy the challenge is to analyze the consequences of pursuing alternative food and agriculture strategy options during the 1990s. However, because the present knowledge base is woefully inadequate for examining alternative strategies, various analytical studies should be undertaken by research institutions in the region during 1987 and 1988. The following list of studies is illustrative of the type of needed studies:

1. Policy options for the wheat industry in SADCC states.
2. Maize policy options in SADCC states.
3. Livestock policy options.
4. Basic science research: The next twenty five years
5. Agricultural research priorities to meet the goals of food security, employment generation and agricultural growth.
6. Human capital improvement options for food and agriculture
7. Agricultural diversification and rural industrialization
8. Agricultural trade policy in SADCC States
9. Food aid policy
10. Nutrition policy

During 1989 the results of the above analytical studies can be reviewed at numerous SADCC conferences. A synthesis volume of the 1990-2000 strategy would be published in late 1989 and reviewed with donors at the 1990 Annual Conference.

IV. SUMMARY AND RECOMMENDATIONS

Summary

1. Over the past six years, SADCC has gained a great deal of experience in designing and implementing seven food and agriculture sub-sector programs that contribute to one overarching objective - to achieve regional self sufficiency in food production. However, the emergence of an improved food outlook in the midst of continued malnutrition and underemployment calls for a broader food and agriculture strategy for the years ahead.
2. There are two sides of the food security equation: food availability through production, storage and trade and the ability of all people to secure a calorie-adequate diet. SADCC's food security portfolio of 12 projects is strongly tilted toward food availability issues (food production and expanding storage) because of the political goal of achieving regional food self-sufficiency.
3. SADCC does not have a regional food security strategy to deal with one half of the food security equation - helping people increase their ability to secure adequate calories through rural income generation (e.g., industrial and export crop production), livestock, rural small scale industry, public works programs, food aid or school feeding programs.
4. SADCC's agricultural research portfolio consists of three projects in search of a regional strategy. Two of the three projects are concerned with generating food crop technology. The third, a land and water management project, should be merged

with the sorghum and millet project. Although increasing food production remains a central part of the regional food security challenge, increased food production cannot by itself ensure regional or national food security. Rural income and employment generating activities are also needed to strengthen the effective demand for food.

5. There is little agreement within SADCC and among donors on the most cost effective way to strengthen basic science research and post-graduate education in Faculties of Agriculture, Science and Engineering in SADCC universities.

Recommendations

1. The SADCC Ministers of Agriculture should reassess the 1980 objectives for the food and agriculture sectors. We recommend replacing the 1980 objective of regional self-sufficiency in food production with the goal of regional food security.
2. We have proposed seven objectives for a SADCC food and agriculture strategy.
3. We recommend preparing an Interim Food and Agriculture Strategy by January 1, 1987 and a long term SADCC Food and Agriculture Strategy, 1990-2000 by January 1, 1990.
4. The long term Strategy can be prepared as follows:
 - A. The seven food and agriculture sectors coordinators should each review their strategy, programs and projects and bring them into line with the seven proposed objectives for SADCC's food and agricultural program.
 - B. The food security sector should review its program of work and determine what needs to be done to develop a regional food security strategy that encompasses both sides of the food security equation. The number of projects should be

reduced over time. For example, the irrigation and the high level manpower projects can be transferred immediately to SACCAR.

- C. The food production mission of SADCC's regional agricultural research program should be replaced with a broad mandate to generate new production technology capable of producing new income streams and jobs in food production export crops, industrial crops and livestock. The CTC for agricultural research should develop a list of Second Generation Projects consistent with this expanded mandate.
- D. The SADCC Ministers of Agriculture should set up a special committee on Post-Graduate Education in Agriculture in order to develop a 20 year plan for strengthening indigenous capacity in basic science research and in expanding post graduate training in faculties of agriculture in the region. The committee on Post-Graduate Education in Agriculture should work closely with Swaziland's Human Resources Committee.
- E. The Ministers of Agriculture and Ministers of Industry should set up a special Agro-Industry Sub Committee in order to develop strategies and projects for employment-intensive industrialization.
- F. SADCC should encourage research institutes in the region to undertake analytical studies on food and agriculture policy options in the region.

- G. Upon the completion of the analytical studies in 1988, the first six months of 1989 would be spent reviewing the results in a series of SADCC conferences. The last six months of 1989 would be spent revising the studies. A synthesis volume entitled SADCC Food and Agriculture Strategy, 1990 - 2000 would be available for discussion at the 1990 Annual Conference.

ANNEX A

CLARIFICATION OF FOOD CONCEPTS 1/

The core concepts in food policy and food security analysis are confusing and in need of clarification.

1. Food First: This populist expression was advanced by Francis Lappe and Joseph Collins in the early 1970s as a nutopian appeal for all people on the planet to share resources and help the poor meet their basic needs, including food. In Food First (1977), Lappe and Collins recommended a reorientation of national development strategies to give higher priority to food production, reduce the reliance on export crops and develop food distribution schemes to ensure that the poor have access to an adequate diet. Food First lost popular support in the late 1970s and the early 1980s as food production expanded in Asia and world grain prices fell. But the authors' concern over access to food is an enduring contribution.
2. Food Self-Sufficiency: This concept dominated global food policy debates in India, China and other Asian countries in the 1970s. It continues to be popular in Africa as a response to recurring drought and the great Ethiopian famine of 1985. Food self-sufficiency can be narrowly defined as the ability of a village, district, nation or a region to meet 100 percent of its staple food needs from domestic production and/or storage under all weather probabilities. A more popular definition of self-sufficiency is the ability of a nation to meet all of its staple food needs through local production and/or storage except during periods of extreme drought or natural disaster when commercial food imports and/or food aid are required.

1/ Eicher (1986).

However, because the weather probability distribution is rarely defined by the author, it is hard to pin down what food self-sufficiency means in operational terms.

In the Sahelian region of West Africa, the concept of regional food self-sufficiency was endorsed by the heads of State following the 1968-74 drought. A Secretariat was established in Ouagadougou to mobilize donor support to enable the Sahel to achieve regional food self-sufficiency by the year 2000. But regional self-sufficiency was never rigorously defined and it has become a moving target.

But the level of food self sufficiency is a useful operational concept if it is backed up with economic analysis. For example, during normal rainfall, Botswana produces about 60 percent of its annual staple food requirements. Botswana recently announced a major policy decision to expand irrigation in order to increase the level of self-sufficiency of staple food production. Unfortunately, there is no supporting economic analysis of what it will cost to increase the level of food self-sufficiency from 60 to 70 to 80 percent as compared with importing food with foreign exchange earnings from livestock and diamond exports (Botswana, 1985).

3. Food Self-Reliance: This concept emerged in the Third World in the 1970s to indicate a process of increasing domestic food production and reducing the reliance on food imports over time. Since the degree of food self-reliance is usually not specified, it remains a fuzzy concept in practice. But the concept has a powerful political appeal and it continues to be used in Africa.

4. Food Strategy: The concept of a national food strategy was endorsed by the Governing Council of the World Food Council in 1979 and was followed by an aggressive campaign to encourage African states to prepare food strategies. In 1980, the European Parliament held a special debate on world food issues. Following the debate, Commissioner Pisani advanced an "Action Plan to Combat World Hunger", also referred to as the Pisani Plan (Pisani, 1982). Pisani argued that project aid was not buying badly needed policy reform in Third World countries and that the concept of a food strategy could facilitate policy dialogue and lead to mutually beneficial policy reforms (Tollens, 1986). Since 1982, the Community has been active in supporting the implementation of food strategies (Strategic Alimentaire) in Zambia, Rwanda, Kenya and Mali (Lipton and Heald 1984; Davies and Lipton, 1985; and Commission, 1986).

The concept of a national food strategy is sound in theory. But in practice, many of the strategies have been prepared by expatriates, most have relied on questionable secondary data and most have concentrated on food availability issues - (increasing food production and expanding grain storage). The World Food Council recently boasted that 30 Africa countries have adopted or are seeking to implement national food strategies (Williams, 1985).

With the exception of Botswana's National Food Strategy ^{1/}, most national food strategies concentrate on increasing food production and storage and devote little attention to politics, policies and programs that shape access to food.

5. Food Security: In 1974 when the World Food Conference was convened in Rome, food security was the dominant theme even though it was never rigorously defined. But the concept of food security finally had little staying power following the Rome Conference because policy makers and donors gave priority to increasing food production and rebuilding world grain reserves. Food security came of age in the early 1980s. In an influential collection of essays edited by Alberto Valdes Food Security for Developing Countries (1981), food security was defined as "the ability of food deficit countries, or regions within countries, to meet target consumption levels on a year-to-year basis (Valdes and Siamwalla, 1981, p.1), a definition that incorporates the effects of both supply and demand. In early 1986, the World Bank issued a food security policy paper Poverty and Hunger (1986) in which food security was defined as "access by all people at all times to enough food for an active, healthy life." (World Bank, 1986, p.1).

Two major lessons emerge from this discussion of the five concepts. First, although food first, food self-reliance and food self-sufficiency have powerful emotional and political appeal, they each have a built-in food production bias and they deflect attention from the key policy question: What is the most cost effective

^{1/} Botswana has pursued a step-by-step process (especially since the 1979 drought) of developing a permanent institutional capacity to deal with drought, household food insecurity and seasonal unemployment. See Holm and Morgan (1985).

mix of domestic food production and storage, food imports and food aid to meet national food security needs? This is a tough political economy type question that only can be answered through intensive research on the trade-offs in pursuing alternative policy options over time (DeJanvry, 1986). Second, food security has emerged as a concept with "staying power". There is a growing consensus that food security should be defined to include both supply factors (e.g., the availability of food) and demand factors (the ability of all members of a society to acquire food).

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