

**The Food Security Equation
In Southern Africa**

by

Mandivamba Rukuni and Carl K. Eicher

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THE FOOD SECURITY EQUATION IN SOUTHERN AFRICA*

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Mandivamba Rukuni and Carl K. Eicher**

1987

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THE FOOD SECURITY EQUATION IN SOUTHERN AFRICA

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INTRODUCTION

The immensity of Africa provides a sober note of reality and humility in discussing food security policy issues and research priorities. Most scientists and policymakers are surprised to learn that the continent of Africa occupies a land area slightly larger than the combined area of the United States, Western Europe and the Peoples Republic of China.¹ The size of Africa is an important issue because empirical evidence throughout the world has shown that agricultural development is a highly location-specific process and it requires location-specific supporting research by social and technical scientists. Even if one moves from the 50 states in Africa to 45 states in sub-Saharan Africa, we are still dealing with an immense land area of six complex and diverse sub-regions, 45 states, seven colonial histories and more than 1,000 different ethnic groups.

The immensity of Africa should be juxtaposed against the desire of donor agencies to develop a general response, typically a strategy paper, to deal with some aspect of the "African Development Crisis." But in the rush to develop general policies, strategies and programmes for Africa, a word of caution is in order. Gerald Helleiner, a Canadian economist with 25 years of research experience on Africa, reminds us that:

Beleaguered policy-makers in developing countries have become quite tired of generalized advice... Unhappiness with 'global' prescriptions has rarely been as vociferous as it has become in recent years in the context of the 'conditionality' attached to IMF, World Bank and other official lending. The IMF and the World Bank usually deny that they employ a single 'model' for all their member countries. Whether these institutions, qua institutions, do or do not, there can be little doubt that, within them, generalized prescriptions abound. (Helleiner, 1986, p. 139).

Helleiner's views should be heeded by donors promoting one institutional model for Africa² and by policy researchers. Experience has shown that economic policy research

¹Africa occupies 11.70 million square miles of land compared with 11.06 million for the combined area of the United States, Western Europe (excluding the Soviet Union) and China.

²A classic example is the World Bank's promotion of the T&V extension model throughout Africa.

is just as location-specific as maize breeding and that generalized policy advice such as "getting prices right" is of little use to policymakers coping with food surpluses in Zimbabwe or food riots in Zambia.

There are at least four options available to researchers for organizing social science and technical research on a common problem such as food insecurity on a sub-Saharan Africa basis. The first option is the generation of cross-country statistical data covering a large number of countries. This approach is routinely used by the FAO and USDA, the two premier sources of agricultural trade data. The second approach is to go to the other extreme and carry out a few in-depth country studies, relying heavily on historical data. For example, two political scientists with several decades of experience in Zaire - Crawford Young and Thomas Turner - recently completed a definitive study - The Rise and Decline of the Zairian State (1985).

The third option is to carry out research on a common problem or sector in one of the six major sub-regions such as the Sahel, Central Africa or the SADCC sub-region of Southern Africa.³ The FAO's report SADCC Agriculture: Toward 2000 (1984) is an example of this approach. The fourth option is to organize an Africa-wide programme of comparative country studies that are linked by a common analytical framework for the study of a policy issue such as food security.

While there are obviously advantages and disadvantages of each of these four approaches, Michigan State University (MSU) agricultural economists, in cooperation with social and technical scientists in several countries in Africa, invested most of 1984 in developing a proposal to carry out a programme of comparative studies of food security in sub-Saharan Africa. The characteristics of MSU's Food Security Comparative Studies Programme are:

1. A common research framework is used to examine the impact of technology, institutions and policy on food availability and food access issues in each country and/or region.
2. The goal is to generate empirical information on how policy changes affect the achievement of household, national and, in some cases, regional (e.g., Southern Africa) food security objectives.

³SADCC - the Southern Africa Development Coordination Conference - was established by the following nine countries in 1980: Angola, Botswana, Lesotho, Mozambique, Malawi, Swaziland, Tanzania, Zambia and Zimbabwe. The major mission of SADCC is to promote social and economic development and reduce dependence on the Republic of South Africa.

3. Each country study includes an explicit, up front commitment to develop indigenous scientific capacity to design and carry out empirical studies, process data locally and assist in strengthening local institutional capacity for policy analysis.
4. The studies are designed to complement on-going food security studies such as the EEC-financed food strategies in Mali and Rwanda and SADCC's regional food security studies and projects that are being carried out by Zimbabwe's Ministry of Lands, Agriculture and Rural Resettlement on behalf of SADCC (see Appendix A).
5. Research results are synthesized through conferences, seminars and working papers that are distributed free of charge within Africa.

MSU food security studies are underway in four countries - Senegal, Mali, Rwanda, Somalia and one sub-region - Southern Africa. In Southern Africa, the work is being carried out through a sub-contract with the Department of Agricultural Economics and Extension of the University of Zimbabwe. The University of Zimbabwe has placed initial emphasis on studies in Zimbabwe in 1985 and 1986. The University of Zimbabwe is currently launching three regional studies - food access, household food security in low rainfall areas and the effects of market liberalization on food security - in cooperation with local researchers in several countries in the SADCC region.

The MSU food security research programme has been underway about 18 months in Mali and Southern Africa, 12 months in Rwanda and six months in Senegal and Somalia. Naturally, there is a budget limit on every research project. If more funds were available, it would be desirable to undertake studies in a larger number of countries - perhaps 8 or 9 - to cope with the immensity and special problems of sub-Saharan Africa. For example, although 18 of the 45 countries in sub-Saharan Africa have a population of less than 3 million, MSU's research programme does not include any country with a population of less than 3 million.

We have organized our paper around the theme - the food security equation in Southern Africa. The thesis of our paper is that there is a serious imbalance in food security research underway in the region. The bulk of the research is focused on the supply side of the equation - i.e., increasing food production, the development of early warning systems, studies of optimum storage levels and action programmes to reduce post harvest losses. More research is needed on the demand (food access) side of the equation in light of the co-existence of malnutrition and food surpluses in the region. High priority food security research priorities are: marketing, trade, exchange rate policies, household food security in low rainfall areas, the effects of market liberalization on the food security of various groups in society and research on institutional innovations that increase access to food.

THE FOOD SECURITY EQUATION: FOOD AVAILABILITY AND ACCESS TO FOOD

In 1976, two economists - Reutlinger and Selowsky - published an influential monograph on Malnutrition and Poverty (1976). The authors challenged the assumption that higher rates of economic growth, food production and market forces would bring about an improvement in nutrition in the Third World within an acceptable time frame.⁴ They also contended that researchers probing the causes of malnutrition have to address the distribution of food among different groups in the population. In 1977, an Oxford economist - Amartya Sen - published an influential paper on entitlements and famine that reinforced the view that poverty, or what Sen called the lack of food entitlements (land, credit, income, family support systems), is a major cause of famine and hunger (Sen, 1977). Sen challenged the prevailing view that famine was caused primarily by a food production shortfall. Sen later expanded his entitlement thesis in his celebrated book Poverty and Famines (1981).

Food Policy⁵ and 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 1986, the World Bank issued a food security policy paper Poverty and Hunger in which food security was defined as "access by all people at all times to enough food for an active and healthy life." Two essential elements are "the availability of food and the ability to acquire it" (World Bank, 1986, p. 1). We believe the Bank's definition will gain wide international acceptance because it is simple but comprehensive and it reminds one that there are two interacting parts of the food security policy and research agendas in the SADCC region: (1) food availability through domestic production, storage and/or trade and, (2) access to food through home production, the market or food transfers.

⁴Reutlinger noted that; "I do not think it is realistic to expect that general and agricultural development in the developing countries will proceed at the pace which would be required to reduce malnutrition substantially within the next 20 years" (Reutlinger, 1977, p. 720).

⁵See Timmer, Falcon and Pearson (1983).

In summary, it has taken about a decade for the results of research on the link between poverty and hunger, famine and malnutrition to gain acceptance in policy circles. This time lag is about the same - a decade - as technical scientists require to develop improved plant varieties.

To date, SADCC and donor agencies have given priority to the supply or food availability side of the equation. For example, food production research (e.g., ICRISAT/SADCC research on sorghum and millet), food production campaigns, early warning systems and expanded grain storage capacity - have been emphasized in the first six years of SADCC's history from 1980 to 1986.

On the food access side of the equation, Botswana has taken the lead in the SADCC region, and probably in all of Africa, in implementing four innovative programmes to cope with drought and household and national food insecurity. Botswana made a strategic decision following the 1979 drought to develop a permanent institutional capacity to cope with drought and to ensure that all members of society have access to a calorie-adequate diet. When the present drought (1982-86) started in 1982, Botswana expanded its Pula for work programme,⁶ supplementary feeding for underweight children, school feeding programmes, and developed irrigation projects to reduce the dependency on rainfall. In 1986 about 600,000 or 60 percent of Botswana's total population received some type of assistance from these food security programmes at some time during the year.

With the exception of Botswana, the food access or demand side of the food security equation is an uncharted area in terms of research and policy experimentation in the SADCC region. There is a need for food surplus Member states to expand their policy analysis capability to determine how to achieve adequate food consumption for groups of the population who are inadequately nourished. In food deficit countries, a key research topic is how to develop efficient food production systems, including cost effective ways to increase the index of food self-sufficiency of key staple foods, while reducing the need to import food under present emergency conditions in the region.

In summary, each SADCC state should address the key policy question: What is the most cost effective mix of domestic food production and storage, trade and/or food aid to meet national food security needs in both the short and long run? Blanket endorsement of concepts such as food first, food self-reliance and food self-sufficiency

⁶Pula is the national currency. In 1985 workers in rural areas received two Pula (about US\$ 1.20) for a six hour day working on infrastructure projects.

do not answer this crucial question. However, food self-sufficiency can be a useful operational concept if it is supported with underlying economic analysis. For example, if Botswana wants to increase its self-sufficiency index of sorghum from 30 to 80 percent through subsidized credit, mechanization and irrigation projects, researchers should find out what these programmes will cost in real terms? How much additional employment will be generated? What is the political value of reducing the ratio of food dependency? These are hard political economy questions that can only be answered by in-depth research.

THE CHANGING FOOD AND AGRICULTURE SITUATION IN THE WORLD ECONOMY, AFRICA AND SOUTHERN AFRICA

The thesis of our paper is that current research on food security in Southern Africa is heavily biased in favor of increasing food availability. This production/storage bias is understandable in light of the 1982-85 drought in the region, and the continuing drought in Botswana in 1985 and 1986. However, because of the rapidly changing global and regional food outlook, it is important to reexamine the food security research agenda.

Global Overview of the Food Situation

The world food pendulum has swung widely every decade or so. India's disastrous harvests of 1965/66 triggered the 1966 world food crisis that was followed by the Sahelian drought and world food crisis of the early 1970s. But the doomsday predictions of the mid-1970s have been followed by a much more optimistic assessment of the world food outlook in the 1980s, punctuated by the great African Famine of 1985 where a conservative estimate of 300,000 people died in Ethiopia alone. The global food outlook is as follows:

- If food in the world were becoming more scarce, its real price would be trending upward. But the real price of wheat in world markets has been falling for well over a century. By the beginning of the 1980s, the real price of wheat in world markets was roughly half what it was 120 years earlier in 1860. Moreover, the price has declined significantly since 1980 (Schuh, 1986).
- The real price of maize in world markets started to decline after World War II with the spread of hybrid maize. Global maize stocks in 1986-87 are 160

million metric tons (a 25 year high) compared with 40 million metric tons in 1983-84.⁷

- The export quotation for No. 2 yellow maize at US gulf ports was US\$ 70/ton in late 1986 as compared with \$US 100 in 1985 and US\$ 160 in 1980.⁸ Maize is at an all time low in real terms.
- The production of rice is running ahead of demand in several large countries in Asia - e.g., India and Indonesia, requiring large adjustment programmes to shift to alternative crops.
- The production of sorghum is running ahead of domestic demand in China, India and Zimbabwe.

In summary, the code word of food scarcity has been replaced by the appealing phrase that the world is "awash with grain" because of near record production and world stocks of all major grains. As a result, there is a need for expanded policy adjustment research. However, only two percent of the operational research budgets of the 13 International Agricultural Research Centers (the CGIAR System) is for policy research. Despite global food abundance, there are an estimated 300 to 900 million people suffering from malnutrition in the Third World.⁹ The FAO estimated that 100 million or roughly one-fourth of the total population of sub-Saharan Africa were not receiving a calorie-adequate diet in 1985.

The central question that flows from this paradox of global abundance and malnutrition is whether malnutrition is primarily a food production or a poverty problem? There is now overwhelming evidence that among the forces that cause malnutrition, one stands out above all others - a lack of purchasing power or poverty (Reutlinger and Selowsky, 1976; Reutlinger, 1977, 1984 and 1986), or what Sen calls a lack of food entitlements (Sen, 1977, 1981 and 1986). The central message that flows from these studies is that since poverty is the main cause of malnutrition, food security can be increased by raising the real incomes of poor households so that they can afford to

⁷Jim Longmire, Cimmyt, Nov. 1986.

⁸Ibid.

⁹There is no standard international agreement on what constitutes a malnourished person.

buy enough food or by helping farmers acquire the resources (e.g., land, credit, etc.) to produce enough food for their families.

The Changing Food Situation in Africa

In 1960, when 17 African states won their independence, sub-Saharan Africa was a modest net exporter of food mostly because West Africa was a large exporter of groundnuts and palm oil (Paulino, 1986, p. 33). But Africa became a net food importer in the late 1960s because of the Sahelian drought, rapid population growth and declining crop yields. In 1985, sub-Saharan Africa imported 12 million tons of grain and three commodities accounted for 87 percent of grain imports: wheat, 50 percent; rice, 22 percent; and maize, 15 percent (USDA, 1986).

Africa's food crisis in the 15 year period from 1970-84 can be captured in a single statistic: food production grew at half the population growth rate during this period. The most important change in Africa's food import picture over the past two decades is the increasing importance of food aid. In the late 1960s, food aid accounted for 5 percent of the total grain imports, increasing to 18 percent in the mid seventies and 40 percent in 1983-85. From 1980 to 1985, food aid increased fivefold while commercial food imports were stagnant. In 1985, food aid accounted for 7 of the 12 million tons of Africa's food imports. But in 1985 food production made a dramatic recovery because of near normal rainfall throughout most of the sub-continent. Table 1 shows that indices of per capita food production increased in 1985. In 1986, the food situation continued to improve except in a few countries such as Botswana.

The Changing Food Situation in Southern Africa

Today, there are 70 million people in the nine SADCC states, up 12 million from the 58 million when SADCC was established in 1980. The population is growing at about 2 million per year and by the year 2000, there will likely be 100 million people in the region. Even though the rate of population growth is projected to level off at 2.9 percent by the year 2000, the population in the SADCC region will likely double from 100 to 200 million sometime between 2020 and 2030.

With 50 to 80 percent of the population in the region deriving their employment from agriculture and rural non-farm employment, it follows that raising the productivity of the agricultural sector is essential for raising the average standard of living in the region.

TABLE 1: Africa

INDICES OF PER CAPITA FOOD PRODUCTION, BY COUNTRY, 1976-85
(1976-78 = 100)

| COUNTRY | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|-------------------------------|------|------|------|------|------|------|------|------|------|------|
| ANGOLA | 105 | 101 | 94 | 93 | 92 | 85 | 85 | 83 | 80 | 79 |
| BENIN (DAHOMEY) | 88 | 101 | 100 | 102 | 90 | 87 | 83 | 77 | 93 | 102 |
| BURUNDI | 99 | 100 | 99 | 96 | 92 | 95 | 93 | 92 | 83 | 85 |
| CAMEROON | 103 | 103 | 93 | 96 | 93 | 92 | 86 | 82 | 86 | 89 |
| ETHIOPIA | 94 | 96 | 108 | 115 | 104 | 102 | 113 | 99 | 89 | 93 |
| GHANA | 106 | 98 | 95 | 102 | 100 | 95 | 89 | 74 | 87 | 88 |
| GUINEA | 101 | 89 | 98 | 95 | 95 | 91 | 96 | 92 | 93 | 96 |
| IVORY COAST | 95 | 101 | 102 | 112 | 118 | 120 | 110 | 103 | 120 | 120 |
| KENYA | 99 | 102 | 97 | 88 | 86 | 89 | 93 | 89 | 75 | 82 |
| LIBERIA | 101 | 102 | 97 | 98 | 100 | 100 | 98 | 100 | 101 | 99 |
| MADAGASCAR | 105 | 103 | 92 | 95 | 95 | 90 | 90 | 92 | 89 | 88 |
| MALAWI | 99 | 97 | 103 | 99 | 99 | 102 | 106 | 101 | 100 | 98 |
| MALI | 99 | 93 | 106 | 102 | 98 | 110 | 107 | 99 | 82 | 97 |
| MOZAMBIQUE | 96 | 100 | 102 | 100 | 99 | 99 | 96 | 73 | 78 | 84 |
| NIGER | 97 | 98 | 103 | 108 | 111 | 102 | 99 | 96 | 61 | 88 |
| NIGERIA | 99 | 100 | 100 | 101 | 103 | 99 | 98 | 84 | 93 | 97 |
| RWANDA | 102 | 99 | 98 | 105 | 100 | 104 | 105 | 105 | 84 | 93 |
| SENEGAL | 110 | 78 | 110 | 83 | 73 | 97 | 98 | 69 | 72 | 80 |
| SIERRA LEONE | 99 | 103 | 97 | 96 | 92 | 88 | 86 | 89 | 80 | 79 |
| SOUTH AFRICA | 96 | 101 | 102 | 96 | 101 | 109 | 94 | 80 | 85 | 90 |
| SUDAN | 97 | 102 | 100 | 80 | 88 | 103 | 82 | 78 | 67 | 98 |
| TANZANIA | 100 | 89 | 100 | 100 | 96 | 96 | 93 | 94 | 90 | 95 |
| TOGO | 101 | 93 | 105 | 109 | 104 | 103 | 98 | 89 | 98 | 102 |
| UGANDA | 100 | 98 | 101 | 92 | 87 | 90 | 94 | 96 | 96 | 95 |
| BURKINA FASO (UPPER VOLTA) | 96 | 100 | 103 | 103 | 94 | 104 | 102 | 94 | 87 | 109 |
| ZAIRE | 102 | 101 | 96 | 97 | 97 | 100 | 101 | 100 | 95 | 96 |
| ZAMBIA | 109 | 101 | 90 | 81 | 84 | 93 | 84 | 91 | 87 | 92 |
| ZIMBABWE | 102 | 100 | 96 | 81 | 83 | 99 | 86 | 64 | 71 | 95 |
| AFRICA, SUB-SAHARA | 100 | 100 | 100 | 99 | 99 | 101 | 97 | 88 | 90 | 95 |
| SUB-SAHARA LESS REP SO AFRICA | 101 | 100 | 99 | 99 | 99 | 99 | 98 | 90 | 90 | 96 |
| ALGERIA | 109 | 94 | 96 | 94 | 102 | 95 | 91 | 84 | 85 | 102 |
| EGYPT | 102 | 99 | 98 | 99 | 99 | 98 | 99 | 98 | 98 | 98 |
| LIBYA | 104 | 95 | 100 | 91 | 91 | 97 | 98 | 95 | 97 | 98 |
| MOROCCO | 109 | 85 | 105 | 99 | 99 | 78 | 98 | 90 | 91 | 93 |
| TUNISIA | 106 | 96 | 97 | 95 | 101 | 106 | 117 | 108 | 119 | 141 |
| AFRICA, NORTH | 106 | 94 | 100 | 98 | 100 | 92 | 99 | 95 | 95 | 101 |
| ALL AFRICA | 101 | 99 | 100 | 98 | 99 | 99 | 98 | 90 | 91 | 97 |
| AFRICA LESS REP SO AFRICA | 102 | 99 | 100 | 99 | 99 | 98 | 98 | 91 | 92 | 97 |

SOURCE: USDA, 1986

Presently there is no definitive assessment of food and agriculture in the SADCC region. The FAO report SADCC Agriculture: Toward 2000 (1984) is a hurried piece of work that has been overtaken by events (Eicher and Mangwiro, 1987). SADCC's Macro Economic Survey, (1986) draws heavily on the FAO report for information on food and agriculture through 1984.

The short term food situation is optimistic in the maize belt in the SADCC region - Zimbabwe, Malawi, Tanzania and Zambia. Maize accounts for half the calories consumed in Zimbabwe and Zambia, and 70 percent in Malawi. The maize belt has a backlog of farmer-tested varieties capable of producing a surplus for intra-regional trade under normal weather conditions.

In early 1987, Zimbabwe had 2.1 million tons of maize in storage which is equivalent to about three years' normal domestic sales by the Grain Marketing Board (GMB). A major question is why has communal (smallholder) maize production in Zimbabwe tripled from independence in 1980 to 1986? Rohrbach (1987) has shown that the growth of white maize in Zimbabwe cannot be attributed to any single factor such as higher prices or favorable weather. The surge in communal (smallholder) maize production in Zimbabwe is the cumulative outcome of agricultural research, an array of institutional improvements and price increases beginning around 1980. Today, all commercial farmers and approximately 85 percent of the communal (smallholder) farmers planting maize in Zimbabwe use hybrid varieties that have been developed through decades of local research starting in 1932. In 1950 Zimbabwe became the first country after the United States to introduce hybrid maize varieties. Another decade of research led to the release of a high yielding variety - SR 52 - to commercial farmers (Eicher, 1984).

Since Zimbabwe (formerly Southern Rhodesia), and Zambia (formerly Northern Rhodesia) were members of the Federation of Rhodesia and Nyasaland when the SR 52 maize variety was released in Zimbabwe in 1960, it was made available to Zambia where it was quickly adopted by commercial farmers. Maize production has recently expanded in Zambia because of new varieties,¹⁰ higher producer prices,¹¹ and the reorganization of the seed parastatal along the lines of a public/private corporation. In 1986 maize

¹⁰Zambia's maize research team has introduced two hybrids and two open pollinated varieties in the past three years.

¹¹Nominal producer prices were doubled from 28 Kwacha per 90 Kg bag in 1985 to 55 Kwacha per bag in 1986.

production reached 1.1 million tons, enough for domestic consumption until the next harvest begins in June of 1987. In Tanzania, maize production recovered in 1986 to the point where Tanzania is self-sufficient in maize, but it is still importing rice and wheat, mainly for urban consumption.

In Malawi, maize is the staple food. The government has given high political priority to expanding maize production and maize has been exported for seven of the past ten years. About 90 percent of maize production is based on open pollinated varieties because hybrids acceptable to consumer tastes have not been developed. Malawi's maize expansion appears to be a function of dramatically higher producer prices,¹² increasing the price of maize relative to other crops, large fertilizer subsidies, and a vigorous extension programme.

In summary, the hallmark of the maize expansion in SADCC's maize belt is a balanced package of technology generation, price incentives, and institutional improvements. However, there are still a number of puzzles about maize? For example, why do consumers in Malawi resist hybrid varieties? Why is maize replacing sorghum in low rainfall areas, southern Zimbabwe, southern Zambia, and parts of Botswana? What are the household food security implications? Do these changes reflect a permanent shift in consumer tastes from sorghum to white maize, or can they be reversed by higher yielding sorghum varieties, price policy, and improvements in village sorghum processing technology? Empirical research is needed to answer these questions.

Policymakers are now faced with some important adjustments in the maize belt. Zimbabwe and Malawi can no longer rely on the Zambian market for disposal of several hundred thousand tons of maize each year because Zambia achieved self-sufficiency in 1986. Tanzania is now self-sufficient in maize. The challenge for SADCC states with maize surpluses is to diversify to oilseeds, higher valued export crops, import substitution crops for local industries (e.g., natural rubber), and expand livestock feeding. In addition, considerable thought should be given to policies to convert some of the maize in silos to feeding people - especially the poor, the malnourished and the underemployed. The food access side of the maize equation in Southern Africa has generally been ignored by policymakers and researchers except in Botswana. Now is the time to pose the question: How can the maize surpluses be used to combat malnutrition and household food insecurity in the region?

¹²For example, the nominal producer price of maize in Malawi was increased 144 percent from 1979-84.

SADCC's food-centered regional agricultural research programme should be reexamined in light of the need for crop diversification in the maize belt. For example, should SADCC develop a regional fruit and vegetable research programme? Should SADCC invest in research on jojoba, nitrogen-fixing trees and horticulture? Although some 3,000 different fruit species are found in Africa, Asia, Latin America, the Caribbean and the Pacific Islands "only four - bananas, pineapple, papaya and mango - have been developed into major crops" (Vietmeyer, 1986, p. 1381). To restate, SADCC should pose the question: What are the strategic long run investments in basic science, post-graduate training, applied research, and infrastructure to speed agricultural diversification and rural industrialization in the maize belt over the next 10 to 15 years? But in the short run, the maize surplus in SADCC states poses several tough questions for SADCC and for donor agencies.

1. What can be done by donor agencies to assist the food deficit SADCC states with foreign exchange constraints in acquiring maize from Malawi, Zimbabwe and Tanzania?
2. Can the backlog of maize varieties be transferred to some of the food deficit countries?
3. How long will it take the ICRISAT/SADCC sorghum and millet research programme to generate white sorghum production technology for low rainfall areas in the region where maize is a risky crop? In short, can research help white sorghum achieve the same genetic potential of maize in the SADCC region?
4. Should SADCC's food-dominated regional research portfolio (e.g., millet, sorghum and grain legumes) be expanded to include research on import substitution crops such as natural rubber and export crops such as jojoba, spices, cut flowers, etc.
5. What can be done to convert some of the maize surpluses to jobs (e.g., food for work, school feeding programmes) and other programs to combat hunger and malnutrition?

No discussion of SADCC agriculture would be complete without a discussion of South Africa - especially its historical role as a major maize exporter in Southern Africa. The objective of maize policy in South Africa is to maintain self-sufficiency and generate a surplus for export during normal weather conditions. Whereas maize production in Zimbabwe normally ranges from 2 to 3 million tons, maize production in South Africa reached a peak of 14.6 million tons in 1981, with about 50 percent used in livestock feed. The 1981 production record was the culmination of large price

increases¹³ and extremely favorable weather. In 1981 and 1982, maize and maize product exports made up nearly 30 percent of the total value of agricultural exports. In 1982-85, because of the drought, South Africa imported maize and, in late 1983, it became a net food importer for the first time since World War II. Maize production returned to normal in 1986 (9 million tons). South Africa will consume about 3 million tons and have 6 million available for export in 1987.

In summary, SADCC agriculture is composed of a maize belt of four countries with a backlog of maize technology and five food deficit countries. This emergence of food surplus and food deficit countries has important implications for SADCC's food and agriculture policy, and food security researchers.

SIX CHALLENGES FOR FOOD SECURITY RESEARCHERS IN SOUTHERN AFRICA

We now turn to a discussion of challenges for food security researchers in Southern Africa. Before proceeding, it is important to clear up several issues:

- a) the definition of food security,
- b) the need for a balanced research programme to address both sides of the food security equation,
- c) the need for multi-disciplinary research and,
- d) an appropriate time frame.

We propose adopting the World Bank's definition of food security - "ensuring that all members of society have access to enough food throughout the year to lead an active and healthy life," (World Bank, 1986). The two key components of food security are food availability (through domestic production, storage and/or trade) and food access (through home production, purchase in the market or food transfers).

It is important that food security is not defined as being synonymous with food self-sufficiency or agricultural development. Food self-sufficiency is a narrower concept than food security. Food self-sufficiency can be narrowly defined as the ability of a nation to supply 100 percent of its staple food needs from domestic production and/or storage under all weather probabilities. Increasing the food self-sufficiency index of a particular crop may be a valid national policy objective. The challenge for food security researchers is to compute the real cost and the reduction of risk associated with

¹³Nominal maize prices were increased 230 percent from 1976 through 1984.

increasing the self-sufficiency index of a particular commodity such as wheat in Lesotho or Zambia. Few SADCC countries currently have the data, analytical skills and time to carry out such exercises. The University of Zimbabwe/CIMMYT study of the wheat industry is an example of the type of research that is needed to add more "substance" to debates on food self-sufficiency (Longmire, Ngobese and Solomon, 1987).

Food security should not be confused with agricultural development - a process of increasing per capita agricultural output. If food security researchers define their research agenda as broadly as agricultural development, they will become bogged down with research on credit, land tenure, processing, etc. In sum, the food security research agenda should be restricted to a limited number of key policy questions and focus on both sides of the equation - food availability and access to food.

The second important issue is the balance between research on food availability (supply issues) and food access (demand issues). While the issue of the proper balance must be sorted out in a country specific context, we estimate that at least three-fourths of ongoing food security studies in Southern Africa are focused on food availability issues, i.e., food production and storage issues. We believe there is a need to shift the ratio to at least 50 percent on food availability and 50 percent on food access research in the near future.

The third background issue is the need for a multi-disciplinary team to pursue research on both sides of the equation. While it is easy to achieve a multi-disciplinary exchange of views at an international conference, it is difficult to bring researchers together from the appropriate mix of disciplines to carry out food security research. We are well aware that the discipline of economics is incapable of providing the breadth of analysis for the range of problems included in the food security research agenda. For example, the University of Zimbabwe's research team on household food security in low rainfall areas requires inputs from anthropologists, sorghum and millet breeders, agronomists, microeconomists, agricultural engineers, macroeconomists, food scientists, nutritionists and others.¹⁴

The final background issue is the time frame. We believe there is a need for 40 to 50 scientists from numerous disciplines to develop a food security research network for Southern Africa and carry out a programme of comparative studies within a ten year time frame. Plant breeders readily admit that it will take around a decade, on average,

¹⁴See the papers by House (1987); Gomez, Mutambenengwe and Moyo (1987); Mbwanda (1987); and Muir-Leresche (1987).

to develop a new plant variety and test it before it is ready for release to extension agents. Why should a food security team working on malnutrition promise results in two to three years when they know it will take 5 to 10 years to answer some of these difficult questions? For example, researchers studying the nutritional impact of shifting from food to export crops have been plagued with the lack of longitudinal data. Most studies have been carried out by a member of a single discipline over a short time span. We are not aware of any study in the region that has examined this problem from a multi-disciplinary perspective over a period of five to ten years.¹⁵ We believe there is a need for multi-disciplinary research on household food insecurity problems, in which nutrition is included as one of the major variables addressed over a ten year period.

We have chosen to organize our remarks on food security research priorities in Southern Africa around six challenges:

1. the food and agriculture production challenge;
2. the marketing, rural infrastructure and storage challenge;
3. the challenge of raising rural per capita incomes and generating employment in rural areas;
4. food access and nutrition challenge;
5. national food security policy analysis; and
6. regional food security policy analysis.

1. The Food and Agriculture Production Challenge

Today, some donors are raising questions about the need to continue investments in agricultural research in light of good harvests in 1986 and 1987 in most of Southern Africa. However, research is needed on how to increase food and agriculture production in SADCC countries for the following reasons: (a) SADCC's population will increase by around 30 million (e.g., 70 to 100 million) by the year 2000;¹⁶ (b) five SADCC states are facing food deficits; (c) annual population growth of 3 percent and income growth of 1 to

¹⁵For a review of the literature see Pinstrup-Andersen, (1985). See Colson, (1984) for an anthropologist's view on household and village food insecurity. For methodological issues in carrying out research on households see Rukuni (1986).

¹⁶The population growth rate in the SADCC region (about 3.2 percent) is roughly triple the annual rate of growth in some industrial countries (e.g., Netherlands and Norway from 1850 to 1900 and Japan from 1878 to 1912) at a comparable stage in their economic history (Eicher, 1986).

2 percent translate into an annual increase in the demand for food of 4 to 5 percent per year - rates that few countries have sustained for a decade or more;¹⁷ (d) there is a lack of proven sorghum and millet packages for smallholders in low rainfall areas where household food insecurity is a major problem; and (e) the expansion of agricultural exports is central to foreign exchange and rural employment generation.

Research is needed on three production issues: (1) increasing food and agricultural production with emphasis on food deficit SADCC states, (2) reducing crop production instability and (3) diversification away from grain, especially in the maize belt. First, let us examine the food and agriculture production challenge. Under conditions of rapid population growth, SADCC states will have to make large investments in agricultural research, human capital, infrastructure, and develop a favorable economic policy environment in order to increase and sustain food production growth rates of 4 to 5 percent per annum. Food security researchers - especially in food deficit countries - should join forces with farming systems researchers in carrying out research on constraints on increasing food and agricultural production. The second aspect of the food and agricultural production challenge is reducing crop instability.¹⁸ Since cereal production is volatile in the SADCC region, the ICRISAT/SADCC research program on sorghum and millet is timely and much needed. Also research on irrigation should be expanded with due note taken of the vast number of failures of irrigation in Eastern and Western Africa. The third type of production research is the development of new production technology to diversify away from grain. This will require stepped-up research on new industrial crops (e.g., natural rubber), export crops (horticultural products, cut flowers) and high value crops such as spices.

2. Marketing, Rural Infrastructure and Storage

The emergence of maize surpluses in Zimbabwe and Malawi, and self-sufficiency in Zambia and Tanzania, and the red sorghum surplus in Zimbabwe, throws the spotlight on the need for marketing and trade research, neglected topics by agricultural economists

¹⁷Most Third World countries have found it difficult to achieve and sustain annual food and agricultural production growth rates of 4 percent or more for one or more decades (Reynolds, 1986).

¹⁸For information on crop production instability in SADCC states for the 1960-80 period, see Koester (1986, p. 45).

relative to research on farming systems and production problems (Eicher, 1986a). The need for marketing research is reinforced by data showing that farmers in Nigeria, Malawi, Tanzania, Kenya and the Sudan received 40 to 50 percent of the final consumer price of grain from 1975 to 1980, a substantially lower percentage than the 71 to 87 percent received by farmers in four Asian countries (Ahmed and Rustagi, 1985). Lower returns to African farmers were attributed to high marketing board charges and higher rural transport costs.¹⁹ Presently most studies of marketing, transportation and storage in the region are being carried out by independent teams. We believe that an integrated research programme on marketing infrastructure, transportation and grain storage is needed in SADCC states.

3. Challenge of Raising Per Capita Incomes and Generating Employment in Rural Areas

Since much of the hunger and malnutrition in African countries is a poverty problem, the challenge for food security researchers is to help develop policies, programmes and projects to raise rural per capita incomes in farming and rural non-farm activities. One of the most direct ways of raising rural per capita incomes in food deficit countries is to increase food and agricultural production. Expanded food production can increase household food security, generate income from the sale of food, or release resources (land and labor) to produce non food crops or off-farm employment. Much of the increase in incomes that farmers will receive will be spent on locally produced goods and services. In food surplus countries, expanded food production can benefit the poor - especially net food purchasers - by driving down the cost of food so that families may eventually spend 20 to 30 percent of their disposable income on food rather than 40 to 60 percent - a common range in Africa.

SADCC's updated food and agriculture strategy explicitly recognized that a direct attack on rural poverty must be broadly conceptualized in a rural economy framework that includes food, export crops, livestock, and rural small scale industries (SADCC, 1987).²⁰ SADCC's present regional research programmes on food crops such as sorghum,

¹⁹Mellor (1984) reports that rural transport costs per ton mile in Africa are typically double those of Asia.

²⁰For a summary, see SADCC (1987a), "SADCC's Updated Policy and Strategy for Food, Agriculture and Natural Resources," in Rukuni and Eicher, pp. 62-65.

millet and grain legumes is being expanded to include research on export crops, industrial crops, etc., in order to generate new production technology capable of producing new income streams and employment for rural people. SADCC's updated food and agricultural strategy was prepared because of the growing awareness among SADCC policymakers that its food-centered strategy would not end hunger and famine, the maize surplus in the maize belt, and a growing understanding that both sides of the food security equation must be addressed.

Closely related to research on raising rural incomes is research on rural employment generation. In the 1950s and 1960s, most development economists assumed that rural-urban migration was a desirable and inevitable feature of the development process. Today few economists argue for government policies to stimulate rural to urban migration because of the pervasive degree of urban unemployment and underemployment, and the inability of rural to urban migrants and school leavers²¹ to find jobs in the industrial urban sectors. For example, in Botswana around 20,000 school leavers are coming on the market each year while 7,600 new jobs are forecast in the industrial-urban sectors over the 1985-91 Development Plan. In Zimbabwe's Five Year Development Plan (1986-1990), high priority is given to rural employment generation because roughly 85,000 school leavers have been added to the labor force for each of the past three years. Only 6,000 or less than 10 percent are estimated to have found jobs in the industrial-urban sector (Zimbabwe, 1986, p. 6). The challenge is how to find productive employment for the remaining 90 percent in the rural economy until there is an expansion in industrial-urban jobs.²²

4. The Food Access and Nutrition Research Challenge

The FAO estimates that roughly one-fourth of the people in sub-Saharan Africa or 100 million were malnourished in 1985. But data are scarce on the incidence of malnutrition by age, sex, income group and within households. The topic of malnutrition is a politically sensitive issue, especially in food surplus countries. Although some of the

²¹A school leaver is someone who has finished school (primary or secondary), or drops out of school and is searching for a job.

²²For an early statement on the need for expanded research on rural employment generation see Eicher, et al. (1970).

nutrition surveys are "classified" in the SADC region, malnutrition is a problem in the region, even in food surplus countries.

It is commonly assumed that 20 to 40 percent of the children in Africa are malnourished. But the data are scarce and rarely reported on a seasonal basis, by agroecological zone or by an administrative unit such as region, province, district, etc. An exception is Botswana where there is a deep political commitment to increasing household food security. Botswana is the only African country to our knowledge that publishes a monthly nutrition surveillance report that covers each region of the country. In November 1986, for example, 17.6 percent of the children in Botswana were underweight for age (less than 80 percent of "normal" weight for age) even though Botswana has a well administered national school feeding program.

Nutrition research is complex and fraught with conceptual difficulties. For example, Field (1977) describes the state of the art of nutrition as the "soft underbelly of applied knowledge." Surveys of seasonal food availability are fraught with conceptual difficulties in disentangling the separate effects of disease and low food intake on weight, height and nutritional well being.

Nutrition improvement programmes are running far ahead of the conceptual understanding of the determinants of malnutrition. For example, although economists such as Reutlinger and Sen have emphasized poverty reduction as the key to improved nutrition, posing the malnutrition problem either as a food production (i.e., lack of available food) or a poverty problem is a vast oversimplification of the issues involved. For example, in a sample of 4,000 families in Nicaragua, Behrman and Wolfe (1984) found that higher income was a strategic factor in improving household nutrition at low levels of income. But as income levels increased, the income impact on nutrient demand faded and other factors such as women's schooling and non nutritive characteristics of food such as taste, convenience, status conferral and time intensity - all played a role in influencing the nutrition status of households.

Because of conceptual and operational problems, some donors are pulling back from nutrition improvement projects.²³ Donors have found that nutrition interventions are dependent on other factors, such as improved health and clean water for successful execution. Moreover, the administrative and professional capacity of Ministries of

²³For example, in fiscal year 1986, the World Bank approved only one new nutrition project worldwide - a US\$ 33.4 million nutrition and community-health project in Indonesia (World Bank, 1986a, pp. 129-130).

Health to plan and implement nutrition projects is in short supply in many African countries. In sum, most donors are in a quandary on how to proceed with nutrition interventions.

What is the nutrition research agenda? In order to design effective food security programmes to combat malnutrition, one must first know who the malnourished are, what they eat, and why they are hungry?²⁴ In much of Africa, basic information is sparse on the incidence and causes of chronic malnutrition and on the socioeconomic characteristics of the malnourished. Methodological advances are needed to design cost-effective means of gathering such information; traditional nutrition studies usually fail to elicit information on the relationship between income and consumption. Conventional income-expenditure studies, especially when conducted in rural areas, are extremely costly. Yet without such information it is impossible to determine the most cost-effective way of increasing caloric intake in a given rural area: Is it through improving home food production, reducing post-harvest losses, or expanding nonfarm employment, coupled with improvements in the food marketing system? In urban areas, knowledge of the consumption patterns of the poor is needed to design programmes that protect the poor from bearing an undue burden of the painful structural adjustments that many African countries are undergoing (Eicher and Staatz, 1986).

Because of the coexistence of malnutrition and overflowing grain silos in the maize belt in the SADCC region, researchers should give urgent attention to the institutional puzzles on how to convert grain to calories via food for work, school feeding programs, etc.

5. National Food Security Policy Studies

The economic analysis of national food security policy options is the crucial link between household and regional food security studies. Because of the vast differences in ideology, institutions and opportunities for development, each SADCC state should develop its own in-house food security policy analysis capability in government ministries, or assist in developing this capacity in local universities. A critical question is: Where is the optimum location of a food security planning/research unit - the Ministry of Agriculture, Ministry of Economic Planning or in the Office of the

²⁴In Malawi several national nutrition surveys have been completed by the Centre of Social Research of the University of Malawi. See Ettema and Msukwa (1985).

President? There is no guideline on this issue except to point out that the Botswana model is appealing in that four inter-ministerial committees feed information on drought, malnutrition, and food insecurity into a coordinating unit in the Ministry of Finance and Economic Planning. Currently there is untapped capacity in planning units in Ministries of Agriculture in most SADCC states that could be mobilized for food security policy analysis. Most planning units are smothered with project aid,²⁵ consumed by its attendant reporting requirements, and have modest analytical capacity to carry out policy studies.

Because of intra-regional trade linkages, it follows that national and regional research programmes should be developed as a unified package and undertaken in a regional framework. Moreover, since African economies are integrated into the world economy through trade and exchange rate linkages, a logical question is what type of economic model is needed to capture these linkages? Computable general equilibrium models (CGE) have been used for this purpose in Egypt, India and South Korea.

De Janvry reports that:

The trade-offs implied between growth of different sectors, security of food entitlements for different social groups, and short-run versus long-run effects are far from obvious and were partially captured in the results we presented from multi-sector, multiclass economic models for India and Egypt. In this new context, Third World countries must, consequently, design their agricultural policies and their strategies of security of food entitlements with a clear understanding and an explicit quantification of these trade-offs (De Janvry, 1986, p. 37).

But the number of macro economists with modeling skills to carry out general equilibrium studies in sub-Saharan African countries is extremely small relative to the number available in countries such as India and Egypt. Moreover, the data base is inadequate for CGE modeling in sub-Saharan Africa.

Most SADCC states do not have an adequate data base and local policy expertise to carry out comprehensive studies of food security policy options. For this reason, food security researchers in Southern Africa should initially concentrate on partial equilibrium and sub-sector studies.²⁶ Priority for sub-sector studies should be given to one or two

²⁵In 1985, in Kenya there were roughly 1,000 different development projects covering all sectors (Eicher, 1985).

²⁶See Shaffer (1970) for a discussion of a methodology to study sub-sectors such as the maize sub-sector of Malawi.

staple foods in the national economy.²⁷ For example, because maize accounts for roughly half of the calories consumed by the average Zimbabwean, the University of Zimbabwe research team is carrying out a comprehensive study of the maize and wheat sub-sectors, including primary data collection for 12 months. After maize and wheat, the sorghum and oilseeds sub-sector will be studied because of the importance of these crops in meeting household food security objectives among communal (smallholder) farmers in low rainfall areas.

What is the record of national food strategies? We are of the opinion that most of the 30 national food strategies that have been prepared in Africa since 1979 on the recommendation of the World Food Council²⁸ have been shallow exercises. Most have relied on secondary data of dubious quality. Most of the food strategies have been prepared with the assistance of expatriate teams over a short period of time. Most of these donor-financed national food strategy exercises do not include ongoing financial and technical assistance to help strengthen local capacity for policy analysis over a 5 to 10 year period. In sum, the World Food Council has failed to provide conceptual and intellectual leadership in showing how to prepare a national food strategy and to convince African states to allocate their own resources to carry out food security policy studies after a national food strategy has been published and put on the shelf.

To our knowledge, there is no local agricultural economist in the SADCC region carrying out research on agricultural trade and exchange rate problems. Since trade and exchange rate policies may be more important than domestic agricultural policies (e.g., agricultural credit) in influencing the performance of the food and agriculture sectors in national economies, a logical question is: What can be done to train a new generation of agricultural economists and economists to devote their career to teaching and research on the macro-economics of food and agriculture?²⁹

Because numerous Asian countries have decades of experience in dealing with food policy issues, including alternative institutions to increase access to food, it is important for researchers in the SADCC region to examine the Asian experience. Two institutional

²⁷For example, domestic resource cost (DRC) analysis is useful in analyzing the real cost to a nation of increasing the self-sufficiency index of wheat (Byerlee and Longmire, 1986).

²⁸See Williams (1985).

²⁹See De Janvry (1986), Kydd (1986), and Schuh (1986), for an elaboration of needed studies.

innovations in Asia - the Famine Codes of India and the free rice ration in Sri Lanka - are of special interest.

In 1880, in India the Famine Commission appointed by the British government issued a report that was a landmark in the history of famines and famine prevention. Soon after the report was issued, the Codes were enacted into law. The Famine Codes provided compulsory guidelines to the local administration throughout India for the anticipation, recognition and relief of famine..., including detailed contingency plans to deal with a food crisis within a legal framework (Dreze, 1986). Subsequent Famine Commissions of 1898 and 1901 refined the Famine Codes based on practical experience in providing dole, cooked food, food for work, etc. The backbone of famine prevention and relief in India today remains the same as 100 years ago - the organization of massive public works in food deficit areas that offered a subsistence (cash) wage. This method was successful in drawing food into deficit areas. The aim of the strategy was to "provide employment at a subsistence (cash) wage and at a reasonable distance from the homes to all who came forward for it" (Dreze, 1986, p. 18). For those who were unable to work, food was provided in the form of doles or kitchens.

Botswana is the first country in Africa to set in motion what India did 100 years ago - establish a permanent institutional capacity to deal with drought and hunger. We believe that a SADCC conference should be convened to study Botswana's pioneering food security programmes that are detailed in Botswana (1985) Holm and Morgan (1985), Hay, Burke and Dako (1985), Holm and Cohen (Forthcoming), and Mokobi (1987).

The second Asian example is Sri Lanka's experiment with a general food subsidy (free rice ration for all citizens) and later with a targeted subsidy program to the poorest half of the population. Sri Lanka has been intensely studied because the advocates of Basic Needs have asserted that three social policies - subsidized food, free education and a free universal health care service - have enabled Sri Lanka to achieve upper income country standards of health, literacy and life expectancy while still a poor country. For example, with 16 million people and a per capita GDP of \$360, Sri Lanka had a higher life expectancy at birth (70) in 1984, than all but two of the 76 low and lower middle income countries in the world (World Bank, 1986b).

Sri Lanka's general rice subsidy policy was started in 1960 when a free rice ration (2 lbs. per week) was made available to every member of society.³⁰ In 1970 a new government supplemented the weekly free rice ration by providing an additional two

³⁰This case study is drawn from Bhalla and Glewwe (1986).

pounds at a subsidized price. In 1977, a new government replaced the general rice subsidy with a targeted program restricted to the poorest half of the population. (Since incomes were based on self-declaration, some leakage to wealthier households was inevitable). The replacement of the general subsidy with a targeted programme starting in 1977 was effective in reaching the poor (almost 70 percent of the bottom half of the population received food). Moreover, targeting reduced the net food subsidies from a level of 14 percent of government expenditures in 1970 to 11 percent in 1979 and to less than 4 percent in 1984 (Bhalla and Glewwe, 1986, p. 54). Sri Lanka's 26 years of experimentation with general and targeted food subsidy programmes should be closely examined by SADCC states.

In summary, research on national food security policy options in SADCC states is in its infancy. Research in progress is heavily weighted toward the food availability side of the equation. The challenge for each SADCC state is to develop a research programme to accumulate a body of knowledge on the central food policy security question: How to assure adequate consumption of food for the entire population throughout the year at the least possible cost?

6. Regional Food Security Policy Studies

The starting point for reviewing regional research priorities is to take stock of the studies being carried out by the Southern Africa Development Coordination Conference (SADCC). When SADCC was established in Lusaka in 1980, the aim of the organization was to accelerate regional co-operation by the nine Member states, further social and economic development and reduce the dependence on South Africa. Seven regional food and agriculture sector programmes were established by SADCC in 1980. Zimbabwe was requested by SADCC to provide leadership in designing and implementing one of the seven programmes - regional food security. The initial SADCC meeting in Lusaka in 1980 did not provide Zimbabwe's Ministry of Agriculture with a definition of regional food security (Murphy, 1983, p. 219), but from 1980 to 1986 it was assumed that regional food self-sufficiency meant increasing food production in the SADCC region and increasing national food storage capacity.

In 1980, the Economics and Markets Branch of Zimbabwe's Ministry of Agriculture was only given six weeks to develop a regional food security programme of work for SADCC (Murphy, 1983, p. 220). One of the first steps taken by the Branch was to set up an Inter Ministerial Committee. Subsequently, two technical level meetings were held comprised of officials from Agriculture Ministries of all nine SADCC countries. Over a

period of several months in mid 1980, the various committees reached the following conclusions about the nature of food insecurity in the SADCC region and steps to meet it:

1. Regional food security was interpreted to mean that "the countries of the SADCC region should be assured of food supplies adequate in both quantitative and qualitative terms to feed their populations."
2. Food production in the region was considered about ten percent below food needs.
3. Since the region had the potential to attain food security by increasing its own food production, this should be the strategic principle on which to base its future food security policy.
4. "A number of measures (proposals) would be necessary which, taken together, would have the effect of reducing constraints to, and encouraging increase in, food production throughout the SADCC countries."
5. Nine regional food security proposals were approved by the Council of Ministers at Maputo in November, 1980. These proposals were later developed into projects and they became the Region's basic food security policy and programme of action. (Murphy, 1983).

In December 1982, Zimbabwe established a Food Security Administration Unit in the Ministry of Agriculture to replace the Economics and Markets Branch in administering SADCC's regional food security programme. Over the 1983-86 period, considerable energy was spent in raising funds from donors to carry out feasibility studies for SADCC's food security projects. (See Appendix A for a current list of SADCC's food security projects.)

The co-existence of malnutrition and food surpluses highlights the need to step up research on regional marketing, trade, nutrition and access to food. Moreover, since food insecurity in the SADCC region can originate in international price movements, it is important to include research on both intra-regional and international trade. Research is also needed on managing foreign exchange, food aid and trade.

SUMMARY

In the long run, economic growth is a powerful instrument for raising per capita incomes and helping the poor purchase a better diet. But there is substantial evidence that it may take a long time before growth will cure poverty. Therefore, some African governments - like governments in industrial countries - are slowly beginning to realize

that they have an obligation to intervene in the short run to ensure that all people have access to a calorie-adequate diet throughout the year. But the research base to guide government debates on food security policy options is severely lacking in SADCC states.

We have highlighted the importance of defining the food security research agenda to include both food availability and food access issues. Presently three-fourths of the scientific man years are carrying out research on one-half of the equation - i.e., food availability issues. A more balanced research programme is called for - i.e., one that devotes at least one-half of research resources to each side of the equation.

The immensity of Africa, the complexity and diversity of its agriculture and the weak data base on food consumption, nutrition, and marketing should be taken into consideration in laying out national and regional research programmes on food security. In the SADCC region, increasing food production in food deficit states is a major challenge for food security researchers working in combination with farming systems researchers. Presently there are no rules, models or guidelines on cost-effective policies and institutions to increase food access in SADCC states. The lack of research on alternative institutions to increase access to food should come as no surprise because, as Myrdal notes, the institutional issues are avoided by "most ordinary economists" (Myrdal, 1984, p. 154).

We believe that food security researchers should argue for parity with plant breeders in terms of length of funding for their research programmes. For example, ICRISAT has cogently made the case for a long term (10 to 20 years) research programme on sorghum and millet for both the Sahelian and the SADCC regions. If it takes ten years, on average, to develop and farmer-test a new plant variety, why shouldn't food security researchers lay out an initial ten year research programme on malnutrition, household food insecurity in low rainfall zones, food access, etc.? At the end of the day, policy makers and donors should realize that the food security research agenda is complex, difficult and requires long term financial support.

APPENDIX A: SADCC'S REGIONAL FOOD SECURITY PROJECTS

Analyses by SADCC of the major issues concerned with the food security of the region led to the identification of a number of projects designed to address these issues which could be more effectively handled on a cooperative rather than on an individual national basis. These projects are:

- Project 1 - A Technical Assistance Programme Designed to Achieve Coordination and Cooperation on all Agrarian Issues.
- Project 2 - An Early Warning System for Food Security.
- Project 3 - A Regional Resources Information System.
- Project 4 - A Regional Inventory of Agricultural Resource Base.
- Project 5 - A Regional Food Reserve.
- Project 6 - Regional Post Production and Food Loss Reduction.
- Project 7 - Regional Food Processing Technology.
- Project 8 - Regional Food Marketing Infrastructure.
- Project 9 - Regional Food Aid.
- Project 10 - Retention and Recruitment of Professional and Technical Staff in the SADCC Ministries of Agriculture.
- Project 11 - Regional Seed Production and Supply.
- Project 12 - Improvement of Irrigation Management.

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