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AN ASSESSMENT OF FOOD SECURITY IN SOUTH AFRICA

G K Coetzee and J van Zyl

INTRODUCTION

The economic disparity between white and black South Africa is most clearly observable in the agricultural sector (Fényes et al., 1988). The commercial farming sector is dominated by whites as regards ownership, while the subsistence sector consists mainly of black families on traditional communal holdings. Some authors refer to this phenomenon as a dual economic system, consisting of both first and third world economies (Groenewald, 1987). However, the South African economy (including agriculture) functions as an integrated system within a relatively small common market (Van Zyl & Groenewald, 1988).

The existing distribution of access to resources, inputs and markets in agriculture between races is highly inequitable due to a number of barriers of a physical and institutional nature (Fényes et al., 1988). As a result, the institutional infrastructure of agriculture, among other things, differs in terms of quality, availability and accessibility between commercial and subsistence farms (or between race groups for that matter). This includes the organized lobbies and representation of groups in government (Van Zyl, 1989a). These imbalances in South African agriculture often lead to policy measures aimed at alleviating problems of the commercial farmers, or affecting welfare transfers to them at the expense of other groups, mainly consumers (Kassier & Vink, 1990). A typical example is provided by the South African maize industry: the producer price of maize is fixed (or supported) at levels higher than the market-clearing equilibrium, resulting in substantial welfare transfers from consumers and tax payers to producers (Frank, 1986; Frank & Nieuwoudt, 1987; Van Zyl, 1989c).

Recent research accentuates the interrelationships in maize markets in South Africa (Van Zyl, 1989b; 1989c). It shows how policy measures aimed at the commercial maize sector also influence all related parties and products in the developing sector. This paper considers the effects of price on food security and the food equation in the developing areas of South Africa. First, the food (or hunger) equation is examined. Special attention is given to the role price plays in the equation. Second, the situation in the developing areas of South Africa is examined. Finally, the results of this analysis are related to other relevant existing empirical knowledge on South Africa.

STRUCTURAL ADJUSTMENT AND FOOD SECURITY

Discussions of economic and agricultural development in Africa have focused heavily on structural adjustment in recent years, i.e. basic policy changes aimed at allowing international and domestic markets to play a greater role in coordinating national economic activities (World Bank, 1988). Often these structural adjustments and accompanying policies aimed at improving economic performance have been based on several implicit assumptions about how African food systems operate (Weber et al., 1988). Yet for many countries, there has been little empirical information to test these hypotheses (Eicher, 1988a).

In recent years food security has come to be defined as "the ability of a country or region to assure, on a long-term basis, that its food system provides the total population

access to a timely, reliable and nutritionally adequate supply of food" (Eicher & Staatz, 1986; World Bank, 1986). Food security thus involves assuring both an adequate supply of food and access of the population to that supply, usually through generating effective demand via income growth or transfers. Food security is therefore influenced by both micro- and macro-factors, ranging from the technology and support institutions available to small farmers and merchants, to monetary, fiscal and trade policies that affect the overall rate of growth and distribution of income.

Over the past number of years, there has been growing empirical and policy support for two fundamental premises about the linkages between food availability, poverty and the access to food (Eicher, 1988b). These premises can be described as the two sides of the hunger equation, namely supply and demand for food. The first premise is that increasing food production, storage and trade can ensure food availability, but this will not automatically ensure that all people have enough to eat, and end hunger. The second premise is that, because poverty is a central cause of hunger and malnutrition, special efforts are needed to help increase the access and entitlement to food. Today specialists on both poles of the hunger equation are advocating legitimate, but partial solutions to conquering hunger (Borlaugh, 1986; 1988; Sen, 1981; 1987; Rukuni & Eicher, 1987; 1988; Singer et al., 1987).

Because insufficient income is a major source of food insecurity, there is considerable complementarity between structural adjustment, which aims at increasing long-term growth of income and employment, and measures to increase food security. Structural adjustments are often needed to get African economies on a path of broad-based growth that will help assure long-term access to food (World Bank, 1988). Effective food security policies aimed at improving the supply of and access to food therefore serve as strategic inputs into sustainable structural adjustment. A key to designing effective food security policies is gaining an empirical understanding of how these various actions affect the constraints and incentives facing various groups in the economy, and hence influence their behaviour (Weber et al., 1988).

Food prices play a dual role in developing countries and regions: they act as incentives to agricultural producers and as major determinants of the real income of consumers. Higher prices may be necessary, at least in the short run, to induce increased food production, yet this imposes a heavy cost on low-income consumers. Timmer et al (1983) termed this "the food price dilemma". Food prices thus play a central role in the hunger or food equation.

Two empirical issues are critical in dealing with this dilemma (Weber et al., 1988). First, who are the net producers and consumers of food? A policy to raise the relative price of food, benefits net sellers of food and hurts net purchasers, at least in the short run. In arguing for higher food prices, most policy-makers and analysts have assumed that the vast majority of rural Africans are net sellers of food, so that raising prices would benefit the rural majority at the expense of the urban minority. The food price dilemma is seen as less severe in Africa than in other parts of the world, largely because most of the food-insecure live in rural areas where access to land is thought to be more egalitarian than in many areas of Asia and Latin America (Eicher & Staatz, 1986; Hyden, 1983). Higher food prices, it is argued, would be a relatively easy way to raise the incomes of the vast majority of the rural poor by increasing the prices they receive for their products.

A second key empirical question regarding the food price dilemma is the magnitude of supply response to higher food prices. If the supply elasticities for food staples are relatively high, higher food prices will not only increase the income of subsistence farmers

substantially, but will also increase the supply of food. Both the demand and the supply side of the food equation are thus influenced positively. Although there is evidence to the contrary in some Sub-Saharan countries (Scandizzo & Bruce, 1980; Martin, 1988), the Zimbabwean case is often used to illustrate a relatively elastic supply of maize (Eicher, 1986; Van Rooyen et al., 1987a).

THE FOOD PRICE DILEMMA: RECENT EMPIRICAL EVIDENCE IN SOUTH AFRICA

Recent empirical evidence questions the assumptions that the majority of rural Africans are net sellers of food and that access to land is relatively egalitarian, both in South Africa (Fényes et al., 1988) and Sub-Saharan Africa (Weber et al., 1988). This section concentrates on evidence obtained in South Africa.

The dominance of the commercial white agricultural production sector of South Africa (Van Rooyen et al., 1987b) implies that the food price dilemma has a different meaning in this region. In practice, the debate is not about whether to raise maize or other food prices in the developing areas of South Africa; higher food prices are often a given because of what happens in the developed sector of South Africa. Thus agricultural and maize policy in South Africa frequently does not take realities in developing areas into account (Van Zyl, 1989b; 1989c). Separate marketing acts for individual developing areas are sometimes the excuse for not doing so. However, due to the interrelationships of maize markets in South Africa, what happens in the developed sector has a profound effect on maize production and marketing in the developing areas. This is illustrated adequately by maize prices: higher maize prices to help mainly white commercial farmers also influence the mainly subsistence small black farmers in the developing areas of South Africa. As has been shown by Weber et al. (1988), the influence depends on who the producers and consumers of food are and on the supply response of small farmers.

The producers and consumers of food

Tables 1 and 2, and Figure 1, show the market participation profile of rural households for selected products in some of the homelands[1]. Data were obtained from Coetzee (1988), Lyne (1989), Vink (1986) and Groenewald & Du Toit (1985).

Although data in Tables 1 and 2 cover only some of the homelands in South Africa, indications are that the situation is confirmed in other areas of Bophuthatswana (Stacey, 1989) and Lebowa (Vink & Van Zyl, 1989) and for other regions (Graaff, 1986; Fenyes et al., 1988). This clearly illustrates that production is highly concentrated and skewly distributed. A high percentage of rural households are net consumers of especially staples even though many of them are engaged in food-crop agriculture. Sales are also highly concentrated with a small minority of households accounting for more than 80 percent of the sector's sales.

[1] The ten homelands are Bophuthatswana, Ciskei, Venda, Transkei, Gazankulu, Qwaqwa, KwaNdebele, Lebowa, KwaZulu and KaNgwane. These areas are also referred to as developing areas.

Table 1
Market participation profile for rural households in KaNgwane (1987) and KwaZulu (1989) in percentage of households

Crop	Market involvement indicator			Percent of total production marketed	Sales concentration indicator		
					Percent of total market sales		
	Net buyers	No net sales or purchases	Net sellers		50%	70%	80%
	(% of households)			(%)	(% of households)		
KaNgwane(N=394)							
Maize	68,7	7,4	23,9	62	2,8	7,4	11,2
Ground nuts	81,7	4,6	13,7	52	3,0	6,1	8,6
Dry beans	96,1	0,3	3,6	-	0,1	1,3	1,5
Yuco beans	95,9	0,0	4,1	66	1,0	1,8	2,5
KwaZulu(N=193)							
Maize	95,2	0,1	4,7	49	0,5	1,3	2,4
Beans	84,0	6,2	9,8	54	3,0	6,0	9,2
Potatoes	93,6	3,3	3,1	40	1,6	2,6	3,6

Source: KaNgwane - Coetzee, 1988; KwaZulu - calculated from data gathered by D.A. Stewart and M.C. Lyne (Lyne, 1989)

Table 2
Marketing response of owners (of cattle) of different herd sizes in Bophuthatswana (1985)

Number of animals per herd	Percentage of owners selling cattle
1 - 10	33,4
11 - 20	52,9
21 - 30	82,4
31 - 40	79,2
41 - 50	84,8
51 - 100	85,1
101 - 150	100,0
more than 150	92,6

Sources: Groenewald & Du Toit, 1985

The data show that the food price dilemma is also severe in South Africa. In this regard the situation differs little from what is experienced in the rest of Sub-Saharan Africa. This also suggests that policy-makers in South Africa need to pay more attention to non-price as well as price constraints to increase non-farm income, particularly among food-deficit rural households.

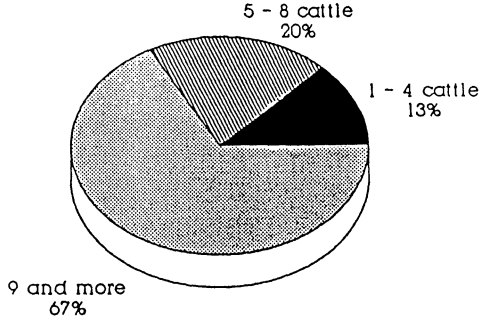

Figure 1: Distribution of cattle ownership in Lebowa - 1985 (N = 101)

Supply response

Reliable econometric evidence on shorter-term supply response for staples is not available for South Africa. Very little work has been done in this area, especially in the developing areas. A recent simulation model of labour, land, food and capital flows between households in rural KwaZulu by Lyne & Ortmann (1989) does, however, shed some light on the problem of supply response.

A mathematical programming model of rural KwaZulu was developed to simulate agricultural production and wage employment in regions of low and high agricultural potential. This regional model aggregates enterprise and wage employment levels predicted for four representative households of which two are in the high potential region and two in the low potential region. The effects of risk, leisure and consumption requirements on household resource allocation are, to some extent, accounted for by the model. Seven economic scenarios were simulated with the model to predict responses to changes in sugar-cane prices, input subsidies, changes in off-farm employment and a rental market for crop land (Lyne & Ortmann, 1989).

A relative increase of 10 percent in the sugar-cane price was estimated to increase income per household by 6,2 percent. However, only sugar-cane growers (high potential region) would benefit from such a measure. Subsidisation of farm inputs, on the other hand,

would benefit farmers in all regions. In a scenario of decreased unemployment, equivalent to a 15 percent increase in the total number of off-farm wage workers, income per household was estimated to increase by nearly 5 per cent. Crop production would be adversely affected and the area of fallow land would increase, which is consistent with the household economic theory (Low, 1986). Net wage remittances would increase and households would be better off. Opposite effects would be experienced with increased unemployment. Where a land rental market is considered together with input subsidies and increased unemployment, Lyne & Ortmann's (1989) model predicted that crop land would be rented, with gains to both lessees and lessors.

Although developed from a limited data base, Lyne & Ortmann's (1989) model does behave according to expectations. This model shows that a policy package is needed to increase food production and income, especially with respect to staples. In addition to changes in price, input subsidies and increasing employment play an important part in food self-sufficiency. The message is the same as that emerging from Zimbabwe's maize revolution, namely identifying and focusing on the prime movers as a policy package (Rohrbach, 1988). This is adequately illustrated by Nieuwoudt's (1988) study of farm household economics and increased earnings from agriculture in KwaZulu. According to Nieuwoudt (1988), an increase in price of staple foods will have a negative income effect on deficit producers. The ordinary total demand elasticities for food deficit and surplus producers are estimated as -0,53 and -0,14 respectively when allowance is made for income effects. As the majority of producers are deficit farmers, increased prices for staples are expected to reduce consumption significantly. Policies that affect agricultural earnings through resource market interventions such as input subsidies and promoting renting arrangements, are thus superior to product price supports on equity grounds.

CONCLUSIONS

Recent empirical evidence in Sub-Saharan Africa accentuates the skewness and concentration in the market participation profile of rural households, especially with respect to staples. Empirical evidence in South Africa shows that it is no exception in this regard. If anything, skewness and concentration in the market participation profile are even more profound in South Africa's developing rural areas.

Supply response to higher prices in these areas is also limited. It seems that complementary factors such as availability and prices for inputs, labour and appropriate technology are probably more important in stimulating food production than price alone.

These findings have important effects on both sides of the hunger equation, namely the supply and demand for food. It also places the food price dilemma on the central stage in South Africa. Higher food prices act as determinants of the real income of consumers. The dominance of the commercial white agricultural sector in South Africa often results in higher food prices for developing agriculture without taking their specific needs and circumstances into account. This emphasises the food price dilemma in South Africa's rural developing regions.

The empirical evidence on South Africa's rural households suggests that policy-makers need to pay considerable attention to non-price as well as price constraints to increase farm production, and to constraints to increasing non-farm income, particularly among food-deficit rural households. This emphasises the importance of a well-coordinated and comprehensive farmer support program as a policy package to promote and secure food security in the

developing regions of South Africa. The Development Bank of Southern Africa's farmer support program (FSP) (Van Rooyen et al., 1987a) plays a crucial part in this respect. Preliminary findings show that the FSP's have made considerable contributions in this regard (DBSA, 1989).

To assist in adequately addressing the constraints to food security, all the elements of the FSP must form an essential part of a comprehensive policy package aimed at alleviating these problems. These include the supply and funding of inputs and production assets to farmers, mechanisation services, marketing services, extension services, training and policy formulation. Especially policy formulation with respect to appropriate pricing policies and regional co-operation is crucial in this process. The empirical evidence clearly illustrates the need for concentrating on a policy package, such as the FSP of DBSA, to achieve food security through structural adjustment.

However, several factors are critical for converting good intentions into effective policy and programmes. These include a recognition on the part of policy-makers of the importance of the empirical nature of policy questions. It also includes a willingness to seek improved empirical information on which to base policy rather than relying on ideology and/or conventional 'wisdom'.

A prerequisite for these programmes to be effective in the South African context is thus a thorough understanding of the realities of South African agriculture. Pricing policy which mostly benefit South Africa's $\pm$ 50 000 commercial white farmers, to a large extent harms the $\pm$ 1 200 000 black smallholders in the development areas, giving rise to increased food insecurity in these areas. By ignoring these realities, the benefits of a comprehensive FSP can potentially be negated. This calls for a shift in emphasis from efficiency towards also taking equity considerations into account. This is especially important in view of the surplus production of agricultural products in South Africa as a whole. A comprehensive policy plan for restructuring agriculture along these lines is thus called for.

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