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POVERTY, HOUSEHOLD FOOD SECURITY AND AGRICULTURAL PRODUCTION: EVIDENCE FROM KWAZULU

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This article presents the results of a survey that explores the relationship between agricultural production and socio-economic status among rural households in the former-homeland of KwaZulu. The survey area is typical of the communally-owned developing areas in South Africa where the majority of the rural poor reside. An overview of household demographics and farming in the study area is presented, followed by an analysis of the factors that distinguish food-surplus from food-deficit producers. The results illustrate the strong relationship between agricultural production and socio-economic status among rural households in South Africa. They show that both supply and demand factors play a crucial role in determining the availability of sufficient food to assure rural household food security. This finding has important policy implications for reducing food insecurity for a large proportion of the present rural poor and landless.

INTRODUCTION

The changing ideas and definitions concerning food security have been summarised by Falcon *et al* (1987) as follows: "... experts no longer perceive the hunger problem as one of starvation or protein deficiency, but rather one of chronic undernutrition, affecting a range of vulnerable groups whose common bond is their poverty". This emphasis on the links between hunger and poverty is the most important change in thinking about world food policy since the World Food Conference (Gittinger *et al*, 1987). These issues are now receiving renewed attention with the forthcoming second World Food Conference.

There is growing empirical and policy support for two fundamental premises about the linkages between food availability, poverty and access to food (Eicher, 1988). These premises can be described as the two sides of the hunger equation, namely the supply of and demand for food. The first premise is that increasing food production, storage and trade can assure food availability. This suggests that appropriate government policies should aim to address identified constraints to increasing food production and marketing. However, this strategy will not necessarily ensure that all people have enough to eat, thus, reducing hunger. This leads to the second premise, which 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.

This article presents the results of a household survey that was carried out in the Izingolweni, Nkandla and Hlabisa magisterial districts in the former-homeland of KwaZulu in South Africa. A total of 198 households were interviewed of which 173 questionnaires were usable. The survey was conducted during the first two weeks of March 1993.

The objective of this paper is to explore and highlight the relationship between agricultural production and socio-economic status among rural households in South Africa. To achieve this, the paper provides a brief overview of the household demographics obtained from the survey—household income levels and asset ownership, together with a description of farming enterprises—labour, agricultural land, inputs, credit, and crop and livestock production. This is followed by an analysis of the factors that distinguish between food-surplus and food-deficit producers. The paper concludes with some observations and recommendations for

appropriate policies stemming from the analysis.

HOUSEHOLD DEMOGRAPHICS

The majority of households live in traditional mud-and-thatch dwellings (58 percent) on land allocated by a tribal chief (88 percent). Average household size is 8.3 persons, but families as large as 16 persons (5.8 percent of households) were also found. Around 63 percent of the households interviewed were headed by males, while the remainder have females as head of the household. In 60 percent of the households the spouses of the household heads were present and part of the family. Females constituted the majority of the total population in the area (55 percent). The proportion of household members under the age of 16 is substantial and was calculated as 43 percent, which is roughly equal to the percentage population between ages 22 and 65. The majority of the population (61 percent) is not married.

The literacy rate is relatively high with 33 percent of the population above the age of six years having at least passed standard six, equivalent to eight years of schooling. Only 11 percent of the population did not have any form of education. It was also determined that 38 percent of the survey population is still at school, 16 percent are under school going age.

When considering the labour force participants it was found that the potential economic active population is equal to approximately 40 percent of the total surveyed population. Of this total, 62.5 percent are unemployed, 31 percent are employed full-time, and 6.5 percent are part-time employed. Those part-time employed are mainly active in the informal sector and typical jobs include mending clothes and shoes, and running small retail enterprises. Typical formal sector jobs include factory workers, construction workers, domestic workers, teachers, mine labourers.

On average, farming accounts for roughly one sixth of total household income. The large majority of households (>90 percent) practice some sort of agricultural activity, with only 3 percent of respondents not having access to land. However, only one-third of households earn income from crop production or livestock activities. This suggests that only a minority of households are able to produce an agricultural surplus, or engage in marketing activities (Table 1).

Sources of income vary widely depending on socio-

Table 1 : Household Income Sources and Average Annual Household Incomes, 1993

INCOME SOURCE	Proportion of households earning an income from source (percent)	Average Income	
		Rand	Coefficient of Variation
Informal jobs	11	96.38	574.39
Formal employment	38	464.14	237.93
Pension	57	200.93	107.25
Crop income	25	413.24	368.99
Livestock income	8	64.63	514.84
Daily trading	15	29.10	381.29

economic status (Table 2). The ultra poor (income <R1 000 per annum) derive most of their income from pensions, while for the more affluent (income >R3 000 per annum), formal jobs are the most important source. For middle-income earners, agriculture plays a fairly consistent role with a relatively constant contribution to income over the spectrum of around 15 percent, but it contributes significantly less for both the ultra poor—suggesting constrained access to resources—and the most affluent, who have many alternative sources of income.

An important aspect of this statistical analysis is that there are no significant differences ($p < 0.05$) between the results obtained for each of the three surveyed areas, namely Ezingolweni, Nkandla and Hlabisa, suggesting a commonality in demographics and household income and asset levels, including sources of income or specific assets.

FARMING CHARACTERISTICS

Agricultural Land

Almost half of the respondents indicated that the land they currently occupy was given to them by a chief, while 17 percent inherited land from their family, and 7 percent occupy land given to them by an *induna*. The majority of respondents occupy land that falls within tribal structures, although eleven percent indicated that they had bought the land from a chief. Respondents generally use all their land, but 19 percent of respondents said that they do not fully utilise their land.

Sixty percent (60 percent) of respondents indicated that they need more land and that they do not have enough land to grow agricultural produce to feed their household. The shortage of land was listed by 46 percent of the respondents as the major factor preventing them from increasing their food production. Another major reason (30 percent) was that family members do not provide enough money for the agricultural enterprise of the household. If households were able to get more land the majority of respondents indicated that they would either plant vegetables (24 percent) or maize (43 percent). Ten percent of respondents, however, indicated that they do not need additional land.

The existence of a rental market for land was also investigated. Nine percent of the households rent land from neighbours, and 11 percent of the households rent land to neighbours. Share-cropping arrangements are an exception rather than the rule as only 3 respondents (1.7 percent) indicated that they are involved in such arrangements. Nevertheless, taken together these results indicate that there is a limited land rental market that could be developed, given a favourable policy and institutional environment.

The majority of households have access to arable land (Table 3). Virtually all community gardens were irrigated, usually by hand (66 percent of respondents). In a few cases use was made of piped water or the gardens were irrigated with canal water. Almost all homestead, kitchen and community gardens were fenced. However, in the case of the main maize fields, more than 67 percent of the respondents who plant maize indicated that their fields were not fenced. This created a problem for many respondents as livestock frequently damaged their crops.

The majority (81 percent) of respondents planted the total area of their crop fields with maize. In the case of community gardens, it was found that 78 percent of the respondents cultivated all their land. The rest of the land—roughly 20 percent of all arable land—was left fallow. This to some extent contradicts the appeal for more land from respondents. On the other hand, it does illustrate the need for and possible advantages of expanding the rental market for land, and of a targeted farmer-support programme to encourage greater intensification of production.

Agricultural Inputs

Agrochemicals. Virtually all respondents use fertiliser on their gardens, maize fields, or both. Only six respondents did not make use of any fertiliser. The majority of the respondents apply manufactured fertiliser, while 13 percent use both manufactured fertiliser and manure, and almost 30 percent of respondents apply only manure. Almost 90 percent of respondents purchased fertiliser on a cash basis only, with nine percent making use of credit facilities. Only 6 percent of respondents apply weedicides, while 46 percent of the respondents indicated that they use pesticides.

The most important inputs, i.e., fertiliser, seed and ploughing services, were all available to the majority of households, but most respondents were unable to purchase these essential inputs on credit, resulting in a high level of cash purchases. This was confirmed by the fact that 68 percent of the respondents view credit as not available when needed.

Mechanisation. Most respondents make use of traditional means to plough their land, i.e., hoe only (20 percent); hoe and span of oxen (4.6 percent); span of oxen (1.7 percent); hoe and hired span of oxen (37.6 percent). Three percent of respondents have their own tractor, while 29 percent hire tractor services from a provided by the contractors, though some respondents did indicate that there is a shortage of contractors in peak periods and that they tend to be too expensive.

Table 2: Annual Household Income Distribution, by Income Source and Strata, 1993 (percent)

Income source	R≤1 500	R1 501-3 000	R3 001-6 000	R6 001-12 000	>R12 000
Crops	6.4	16.3	13.6	18.4	8.6
Pension	89.0	63.7	37.4	4.5	5.5
Informal jobs	2.6	13.7	7.1	13.8	15.6
Formal jobs	3.7	6.3	41.8	63.2	70.0

Table 3: Type, Location and Size of Arable Land, 1993 (Percent of respondents)

Type of land	Respondents with access	Distance from house			Size			Irrigated	
		Next to	<1 km	>1 km	Large	Medium	Small	Yes	No
Community gardens	41.6	19	46	35	25	32	43	91	9
Crop fields	79.4	47	19	34	57	31	12	13	87

* Mean sizes are:

Community gardens: Large = 0.31 ha; Medium = 0.14 ha; and Small = 0.04 ha.

Crop fields: Large = 2.56 ha; Medium = 1.48 ha; and Small = 0.96 ha.

Labour. In general the head of the household and/or the spouse take charge of household agricultural activities, spending around 25 hours per week during the summer and 14 hours per week in the winter on agricultural activities. Most respondents (63.6 percent) employ no labour from outside the household. Those households that do hire in labour employ between 1-5 labourers, with some employing as many as 12 labourers. The wages paid to these labourers are around R4-R5 per day. These labourers generally earn only the wage but about one-quarter of the respondents that do employ labourers indicated that they also provide in-kind payments, e.g., potatoes, maize, or meals.

Apart from agriculture, unemployed household members are involved in few other income-earning activities. Some sell sorghum beer, soft goods, chickens and wood. These activities are not, however, important sources of income, though it does illustrate possible scope for expanding informal rural enterprises.

Credit. Only 17 percent of respondents utilise credit, which comes from a variety of sources (Table 4). Most respondents (65 percent) were not interested in ever taking out loans. Those who did indicated that they did not anticipate using the credit for agricultural or other productive purposes, instead using the loan either to "earn more money" and/or to "build a new house". Few respondents, however, seemed to have any idea of how they would repay such "unproductive" loans.

Agricultural Production

Crops. Crop production is largely to satisfy subsistence needs, with only a small proportion of households

Table 4: Use and Sources of Credit (percent)

Source	Households using credit	Share of total credit
Local store	5.8	24.1
Farmers' Association	4.0	23.5
KFC	3.5	32.6
Friends	1.2	12.1
Other	2.4	8.7

selling some of their harvest. This accounts for the relatively low income derived from crop production (Table 5).

Livestock. In the majority of cases (67 percent), the local *livuduna* is in charge of the grazing land in a particular area. The large majority of households have access to grazing land, with only 7.5 percent of respondents indicating that they have no grazing rights. Roughly half of the respondents (51 percent) had cattle, while one third (31 percent) had goats (Table 6).

Despite having access to grazing land and an average cattle ownership of 3.31, it was found that half of the respondents did not own any cattle, and few cattle are traded. The number of cattle owned ranges from 1 to as many as 22, with most households owning between 1 and 10 head of cattle. More than one-quarter of respondents indicated that they have lost cattle through death or theft during the past year, with losses ranging between 1 and 4 animals per household.

Households' perception of the condition of the natural grazing was also investigated. Almost half of the respondents are of the opinion that it is deteriorating.

Table 5: Crops Produced by Respondents, 1992

Crop	Respondents who grow crops (Percent)	Average Total Yield (kg)	Amount Sold (Percent of respondents growing the crop)	Average Income per seller (R)
Maize	92.5	300	9.8	136.18
Dry Beans	57.2	70	9.2	31.22
Pumpkins	45.1	65	2.9	28.44
White potatoes	54.9	300	18.5	190.45
Cabbages	38.2	150	12.7	34.83

Table 6: Livestock Ownership, Sales and Purchases per Household in KwaZulu, 1992

Item	Cattle	Goats	Chickens	Pigs
Average number owned	3.3	2.0	8.5	0.5
Respondents with livestock (percent)	51	31	69	16
Respondents buying/selling (percent)	3			

The dry conditions in KwaZulu during 1991, 1992 and 1993 probably contributed to these perceptions.

FACTORS ASSOCIATED WITH SURPLUS PRODUCTION

The previous section revealed a number of important findings with respect to agricultural production and income. Only a small proportion of agricultural output is marketed in the three areas surveyed. Most output is retained to satisfy household food requirements. Although most respondents indicated that they had access to land, almost one-fifth said they were unable to utilise the resource fully. Few respondents were able to utilise credit channels, thus, the usage of agrochemicals is low and little extra labour is hired in.

Overall the agricultural production system is characterised by subsistence, and its further development is constrained by limited access to important support services. Nevertheless, some households are able to produce a surplus. For the purposes of this paper, we distinguish between two groups of producers: those households that produce more than subsistence needs (12-14 bags of maize) and earn an income from maize production are classified as surplus producers or emerging farmers, and those that are only able to meet their basic household food requirements are classified as subsistence farmers.

Discriminant analysis was used to determine which factors are associated with surplus production. It was postulated that emerging farmers can be considered part of the rural elite and would therefore own more cattle (CATTLE), have greater liquidity (LIQUID) resulting from remittances and pensions, have more contact with extension staff (EXTENSION), control larger farms (LAND) and more irrigated land (IRRIGATION). They would also tend to rent in or have access to more land (RENT) than subsistence farmers. In addition, it was anticipated that the incidence of households owning farm machinery and implements (MACHINERY) would be higher among emerging farmers, where this would also tend to give emerging farmers greater access to credit (CREDIT).

The calculated results show that, as expected, all

coefficients have positive signs (Table 7). A highly significant factor distinguishing between surplus and deficit producers was that the former use more credit than the latter. Liquidity, which is also associated with access to short-term funds and finance, is the second most important determining variable. This is followed by the two land size variables--total cultivated area and percentage of area irrigated. None of the other factors--cattle, more contact with extension staff, renting or borrowing of additional land and machinery ownership--were significant at the ten percent level of probability. In most cases, even the means of these other factors were illogical. According to this analysis, at least, it does not seem as if surplus producers are associated with a higher level of cattle ownership (cf. Kirsten *et al.*, 1993). These results, however, may have been influenced and distorted by the severe drought experienced during the production season under consideration as output was used to categorise farmers.

An alternative approach to classifying subsistence and emerging farmers is in terms of household expenditure, rather than in terms of income or sales. In this case, expenditure can be regarded as a more meaningful distinguishing factor because it reflects a household's intention to produce a larger output. Income, on the other hand, can be adversely affected by a number of factors, including the weather and levels of own consumption. Given the drought experienced during the production season under consideration, it is likely that income patterns were distorted. Using expenditure, it was postulated that the same factors considered above will also distinguish between subsistence farmers (defined as having expenditures on farm inputs less than R400) and emerging farmers (defined as having expenditures on farm inputs greater than R400). (Table 8).

As expected, the signs of the coefficients are all positive. The relative importance of each explanatory variable in discriminating between subsistence and emerging farmers is given by the magnitude of its standardised coefficient. Credit is therefore deemed to be the most important variable determining group membership. Farm size, however, is also important, while liquidity coming from remittances and pensions is another major distinguishing factor. Although land

Table 7: Discriminant Function Analysis Based on Income, 1992

Discriminant variable	Standard discriminant function		Group means*		
	Standardised Coefficient	Significance (P < F)	Subsistence farmer	Emerging farmer	Significance (P < t)
CREDIT (R)	0.418	0.0001	3.22	124.13	0.0001
LIQUID (R)	0.326	0.0239	374.88	612.17	0.0047
LAND (ha)	0.294	0.0477	1.01	1.68	0.0482
IRRIGATION (ha)	0.188	0.0864	0.02	0.31	0.0815
Number of cases			128	43	-

* Subsistence farmers are defined as those producing 12-14 bags of maize per annum or less and not deriving any income from sales of maize. Emerging farmers are classified as those exceeding subsistence requirements.

Table 8: Discriminant Function Analysis Based on Expenditure, 1992, 1992

Explanatory variable	Discriminant function		Group means*	
	Standardised coefficient	Significance (P<F)	Subsistence	Emerging
CREDIT (R)	0.483	0.0041	2.46	126.91
LAND (ha)	0.414	0.0126	1.07	1.66
LIQUID (R)	0.338	0.0314	362.82	627.19
EXTENSION (Visits)	0.208	0.0526	0.52	2.47
RENT (percent)	0.149	0.0919	3.14	5.12
Number of cases			115	56

* Subsistence farmers are defined as those having expenditures on farm inputs less than R400. Emerging farmers are classified as those spending more than R400.

rental and extension are less important, their combined effect is greater than that of liquidity. Irrigation and machinery are not significant at the ten percent level of probability, but as expected show higher means for emerging farmers.

DISCUSSION

The results obtained above indicate that both supply and demand factors are important in determining rural household food security. This suggests that policies aimed at improving food security will need to address both supply-side and demand-side factors. A variety of characteristics of the food security problem and institutional capabilities need to be considered when making policy choices (Von Braun *et al*, 1992). These include macroeconomic policies, storage policies, production policies and programmes, income and employment generation policies and programmes, targeted distribution and food subsidies and emergency relief programmes. Although all these are important and relevant in the South African situation as depicted by the survey results in KwaZulu, specific emphasis needs to be placed on production policies and programmes, as well as income and employment generation policies and programmes.

Direct support to farmers plays a particularly important role, as is illustrated by the Farmer-Support Programme (FSP) of the Development Bank of Southern Africa. Results of the FSP (Van Zyl *et al*, 1991; Lyne and Ortmann, 1991; Kirsten *et al*, 1993) indicate that the programme contributed to increased household production and household income. The programme enabled households to produce sufficient staples, releasing resources that could be used to purchase other foodstuffs and/or durables. This in many cases resulted in a better balanced diet of households and a higher quality of life. A further expansion of this type of programme to reach more rural households should be one of the aspects to be considered in a food security policy for South Africa.

The results of this study illustrate the relationship between poverty, household food security and agricultural production. Rural households have few income-generating opportunities apart from the marketing of agricultural output that is surplus to household food requirements. Therefore key policies should aim: (i) to support farmers to increase production through productivity-enhancing investments; and (ii) to encourage the formation and deepening of a land market to enable more efficient producers to acquire more land and boost production.

CONCLUSIONS

Local and international research has shown that small and subsistence farmers and other rural people in the developing areas are the most affected by food insecurity (Von Braun *et al*, 1992). These people are therefore an important target group for the implementation of programmes to counter food insecurity. Farmer-support programmes are viewed as the most effective way in stimulating rural development. It is therefore appropriate to develop a comprehensive farmer-support programme to be implemented within the context of a broader and umbrella policy framework for agricultural development.

In general, food insecurity is higher among rural landless and quasi-landless households (Von Braun *et al*, 1992) than among other groups, which is also typical of the situation in South Africa. At present commercial agriculture and developing farming are faced with the challenge of restructuring, both from an economic efficiency and economic sustainability point of view. But restructuring is also likely to improve the food security situation of the rural poor. Properly implemented, a land reform programme with well-adapted agricultural support services is likely to remove some of the demand- and supply-side problems currently constraining dynamic growth in agriculture. This will, in turn, ensure more opportunities for black smallholder farmers, thereby reducing food insecurity amongst a large proportion of the present rural poor.

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