
HOUSEHOLD AND NATIONAL FOOD SECURITY IN SOUTHERN AFRICA



Edited by

Godfrey D. Mudimu & Richard H. Bernsten

University of Zimbabwe UZ/MSU Food Research in Southern Africa

HOUSEHOLD AND NATIONAL FOOD SECURITY IN SOUTHERN AFRICA

Edited by
Godfrey Mudimu
Richard H. Bernsten

UZ/MSU Food Security Research in Southern Africa Project
Department of Agricultural Economics and Extension
University of Zimbabwe
P.O. Box MP 167,
Harare, Zimbabwe
Telex 4152 ZW
Telephone 303211 Extension 1516

**HOUSEHOLD STRATEGIES FOR COPING WITH
FOOD INSECURITY IN LOW-RAINFALL AREAS
OF ZIMBABWE**

T. Matiza, L.M. Zinyama, and
D.J. Campbell

209

**FARMER MARKETING STRATEGIES TO IMPROVE
FOOD SECURITY**

S. Chigume and J.D. Shaffer

223

**SECTION 6: EXPANDING AGRICULTURAL TRADE IN
THE SADCC REGION**

**EXCHANGE RATE OVERVALUATION AND
AGRICULTURAL PERFORMANCE IN
ZIMBABWE: 1965-1985**

K. Mlambo

243

**AGRICULTURAL PRICING POLICY AND
TRADE IN SEVERAL SADCC COUNTRIES:
PRELIMINARY RESULTS**

D.S. Kingsbury

259

**TRADER PERCEPTIONS OF CONSTRAINTS
TO EXPANDING AGRICULTURAL INPUT
TRADE AMONG SELECTED SADCC
COUNTRIES: PRELIMINARY RESULTS**

J. Rusike

277

SECTION 7: NUTRITION AND FOOD TRANSFERS

**EXPERIENCES IN INCREASING FOOD ACCESS
AND NUTRITION IN ZIMBABWE**

J. Tagwireyi

307

**NUTRITION AND AGRICULTURAL POLICY
ISSUES: CURRENT EVIDENCE AND RESEARCH
AGENDA**

C. Sindwazi

315

ACKNOWLEDGEMENTS

The Fourth Annual Conference on Food Security Research in Southern Africa provided an opportunity for regional researchers, policymakers, government officials, private sector participants, and donor representatives to share research results and experiences in improving food security in Southern Africa. The studies reported in the proceedings are part of a larger cooperative agreement project on food security in Sub-Saharan Africa that is directed by Michael Weber of Michigan State University's Department of Agricultural Economics. The UZ/MSU Food Security Research Programme is being carried out in conjunction with the Department of Agricultural Economics and Extension, University of Zimbabwe.

Many individuals and institutions have contributed to making the conference a success. We extend our gratitude to the authors of the research papers for their intellectual contributions to the debate on improving food security in Southern Africa; and to the policymakers, private sector participants, government officials, and donor representatives for attending the conference and sharing their insights on the critical issues raised.

The Food Security Research Project has benefitted from the generous support of Sam Muchena and John Dhliwayo, of the Ministry of Lands, Agriculture, and Rural Resettlement (Zimbabwe). In their roles as leaders of SADCC's Food Security Administrative and Technical Unit, they have been particularly helpful in planning the annual conference and identifying relevant research themes that complement SADCC's Food Security Programme.

The Food Security Research Project is financed by the U.S. Agency for International Development, Bureau of Science and Technology; Bureau for Africa; and the Southern Africa Regional Programme; under a *Food Security in Africa* cooperative agreement (DAN-1190-A-00-4092-00) with the Department of Agricultural Economics, Michigan State University and Memorandum of Understanding with the Department of Agricultural Economics and Extension, University of Zimbabwe. We are particularly appreciative of the support we have received from USAID officials, including Allison Herrick, Eric Witt, Joshua Mushuari, Doug Pickett, and Brad Wallach of USAID/Zimbabwe; and our Washington-based project managers, Michael Yates (Science and Technology) and Patricia O'Brien (Africa Bureau).

We convey our appreciation to Thembi Sibanda and Murie Hutchison for an excellent job in organizing the Fourth Annual Conference, and to the numerous individuals who helped to make the conference a success: Lovemore Nyabako, Maxwell Chiwashira, Sampson Maguhudze, George Nyamatemba, Ronald Sagwete, Pete Hopkins, and Andrew Barnes.

We are especially indebted to Corinne Smith for her patience, skill, and dedication in word processing the proceedings--and to her husband, Lionel, for his assistance in solving software problems. Their team effort has made this publication possible.

Finally, we thank Chris Wolf and Elizabeth Bartilson for providing software support.

NUTRITION AND AGRICULTURAL POLICY ISSUES: CURRENT EVIDENCE AND RESEARCH AGENDA¹

Catherine Siandwazi²

INTRODUCTION

Accelerating agricultural production by shifting from subsistence or semi-subsistence food production to the production of cash crops is the cornerstone of economic development. But, agricultural policies to increase agricultural production may have a negative or less than expected impact on the nutritional status of any given population. The determinants of nutritional status include the availability of food, the ability of the household to acquire available food, the desire to obtain food to which the households have access, and intrahousehold food distribution.

Various field studies have shown that poverty is a central cause of malnutrition in both rural and urban areas. The determinants of rural poverty are closely related to land tenure and the characteristics of agricultural production--including the type of production technology and the availability of credit, extension services, infrastructure, agricultural services, and market opportunities.

In many African countries, the expected improvements in nutrition have failed to materialize from expanded food and agricultural production. In some cases, the transition from subsistence to cash agriculture has had a negative effect on staple food production and, consequently, on household food security and nutrition. It is, therefore, essential to examine the causes of malnutrition through expanded research on the production and consumption linkages of rural families.

The purpose of this paper is to assemble current evidence derived from past research and use this information to discuss some relevant nutritional and agricultural issues in our region and to identify areas for further research.

AGRICULTURAL POLICIES AND NUTRITION LINKAGES

The link between household nutritional status and agricultural policies or strategies is not well established. Conventional discussions tend to assume that increased crop yields and gross income will improve nutrition.

¹The author has benefitted from comments by Nancy Verlade of ARPT (Adaptive Research Planning Team, Ministry of Agriculture and Cooperatives); and colleagues at RDSB (Rural Development Studies Bureau, University of Zambia); and the ZNCB (Zambia National Commercial Bank).

²National Food and Nutrition Commission Lusaka, Zambia.

From a nutrition point of view, it is clearly insufficient to use an increase in production as an indicator of the nutritional impact of agricultural policies because the potential benefits may be negated by other factors. Malnutrition is a reasonably sensitive indicator of socioeconomic deprivation. When the nutritional status of the rural farm households does not improve, there is good reason to believe that the economic situation of the poor is also not improving.

Figure 1 shows some of the linkages between nutrition and agriculture. Agricultural policies influence nutrition through their effects on:

- o the food production systems of subsistence farm households and cash cropping in semi-subsistence farm households;
- o fluctuations in food availability and access (storage facilities, food prices, environment, and the social network);
- o adoption of technology such as improved seeds, fertilizer, and the use of oxen;
- o farm household income, its composition, and intrahousehold income allocation;
- o household labour and time allocation; particularly women's time allocation; and,
- o infectious diseases.

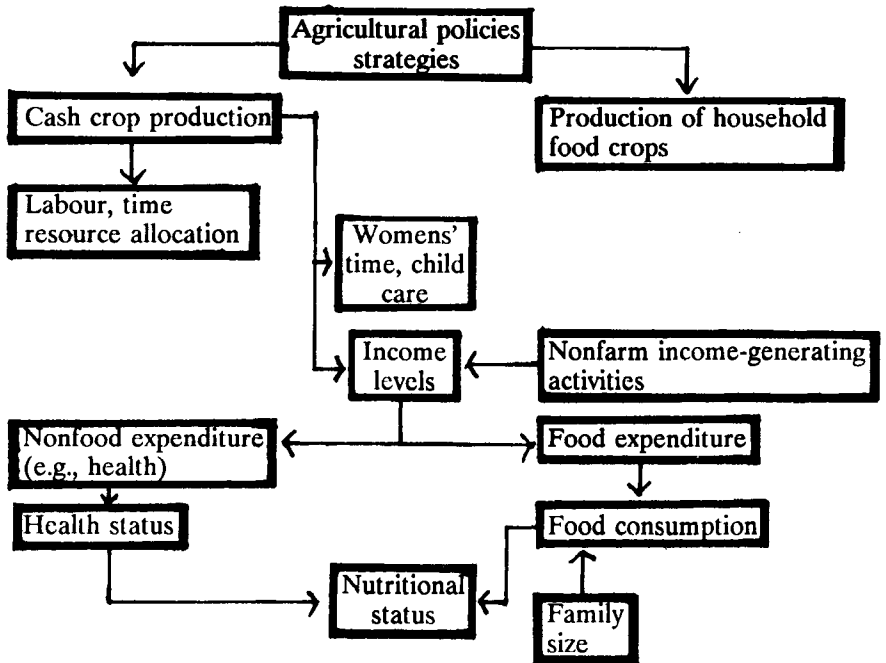


Figure 1. Some nutrition and agriculture linkages.

Any significant changes in these factors is likely to influence food consumption of household members, especially those malnourished or at risk of becoming malnourished. Therefore, using an increase in production as a proxy to measure nutritional effects is likely to be misleading.

NUTRITIONAL EFFECTS OF FOOD PRODUCTION

The ability of farm households to acquire food is influenced through changes in food availability, rural incomes, and food prices. Changes in the cropping systems may influence the amount and types of food produced and, consequently, the level of fluctuation in availability of food during the year.

Seasonal fluctuations in food availability are particularly relevant in the SADCC region because of the heavy reliance on a single annual crop cycle. Since irrigation facilities are not widespread outside the commercial farming sector, a single crop harvest must provide sufficient food for the whole year. Also, storage facilities, which are inadequate at the farm level, allow for huge losses.

A seasonal decline in food consumption during severe stock draw-down is linked to nutrition requirements, labour input, and morbidity patterns. In some countries with a unimodal rainfall pattern, food consumption declines during the heavy planting season. Furthermore, increased incidence of diseases during the rainy season can adversely affect the nutritional status of the household members. For example, seasonal nutritional stress associated with increased incidences of debilitating diseases, such as malaria and diarrhoea, has been observed in working adult populations during the heavy planting seasons (IFPRI, RDSB, and NFNC, 1985; Milimo and Siandwazi, 1988). Table 1 indicates that in Eastern Zambia adults suffer most from nutritional stress during the late planting and heavy weeding period. As indicated earlier, this is also when grain stocks are low, labour demands are greatest, and there is a high incidence of malaria and diarrhoea.

The incidence of debilitating diseases, coinciding with heavy work periods and food stock depletion, have serious labour implications for the year-to-year fluctuations in agricultural production and the prospects for long-term production. Food scarcity can influence food production through its impact on both the quantity and quality of labour input.

Spurr (1984) found that malnutrition among adult workers reduces work capacity. In the initial stages, it is a direct result of weight loss. But after a 10% body weight reduction from normal levels, additional factors such as cardiovascular inefficiency and anaemia may play a role in reducing work capacity. Strauss (1986) found that increasing caloric intake leads to an increase in farm output. An IFPRI/RDSB/NFNC (1985) study found a positive correlation between food consumption and total area. Households planted twice as much area if hybrid maize for home consumption lasted beyond January, the traditional hungry period.

Table 1. Percentages of adult respondents with low weight/height ratios by agricultural season, Eastern Province, Zambia, 1981-82.

Period in the agricultural calendar	Males (N=155) Less than 29 ^a	Females (N=155) Less than 29 ^a
Postharvest (September 1981)	57.4	41.3
Rainy season (January 1982)	62.6	49.0
Preharvest (May 1982)	66.5	47.7

^aWeight/height ratios of less than 29 denote severe malnutrition.
Source: Kumar (1987).

NUTRITIONAL EFFECTS OF CASH CROPPING

Protein-energy malnutrition, particularly among the rural farm households, is often a result of seasonal fluctuations in food availability, food prices, and income. Depending on the nature of the agricultural policies, they may alleviate or increase the incidence of malnutrition. Agricultural policies that encourage farmers to shift from a diversified cropping system to cash crop production may have a negative effect on nutrition, particularly where cash crops are promoted at the expense of mixed food crops traditionally produced for home consumption.

Existing evidence on nutritional effects of agricultural commercialisation among the small-scale farmers suggest both negative and positive effects. The net effects depend on whether cash cropping is promoted parallel to the subsistence staple crops, or as a substitute for them. Changes in the cropping systems that influence the amount and type of food produced and fluctuations in food availability during the year are more likely to have important nutritional effects (Pinstrup-Andersen, 1987).

Current evidence suggests that cash crops reduce the subsistence food crops area by physically displacing food crops, and thereby reduce the availability of food to the household. Also, increased prevalences of malnutrition have been associated with cash crop production. As subsistence farmers become more commercially oriented, the nutritional status of their children under the age of 5 years declines. Childhood malnutrition was found to be more prevalent among small-scale farmers who adopted hybrid maize for sale than those who also grew other crops for home consumption such as millet and sorghum (Table 2).

This suggests that agricultural research should focus on developing both appropriate cash and subsistence crops to meet nutritional needs of the households (Holdsworth, *et al.*, 1986; Siandwazi, 1988). While considerable agricultural research is devoted to cash crops, until recently, little attention has been paid to household food crops. Alleviation of the nutrition problem would be greatly enhanced if agricultural research put greater emphasis on improving the household food and storage systems, and developing improved varieties of staple food crops.

Table 2. Indicators of nutritional status as percent Z-scores^a for malnourished pre-schoolers (< 10 years) by ecological zone and hybrid maize adoption by survey round, Eastern Province, Zambia, 1986.

	Project area ^b		Plateau		Valley		Hybrid maize adoption					
							Plateau				Valley	
	%	N	%	N	%	N	Low	N	High	N	Low	N
Round 1 (N=758)												
Weight-for-age	26	79	28	76	9	3	27	38	38	38	9	3
Height-for-age	56	170	57	156	42	14	54	77	61	79	42	14
Weight-for-height	5	16	6	15	3	1	6	9	5	3	3	1
Round 2 (N=927)												
Weight-for-age	13 ^c	54	13	43	18	11	9	17	17	26	18	11
Height-for-age	48	194	50	171	37	23	43	79	58	92	37	23
Weight-for-height	3	10	2	8	3	2	2	4	3	4	3	2
Round 3 (N=800+)												
Weight-for-age	15	63	50	49	19	14	9	15	20	34	19	14
Height-for-age	41	169	42	142	37	27	41	69	43	73	37	27
Weight-for-height	2	6	1	4	3	2	1	2	1	2	3	2
Round 4 (N=938)												
Weight-for-age	16	58	17	49	11	9	15	21	19	28	11	9
Height-for-age	40	145	43	121	29	24	43	59	43	62	27	24
Weight-for-height	3	10	1	4	7	6	1	1	2	3	7	6

^aThe U.S. NCHS are used as reference Z-scores for nutritional indicators. Z-score values below -2 denote malnutrition. Note the absence of high technology adoption in the valley. Both valley areas have been categorized as low technology adopters.

^bProject area consists of valley and plateau areas which are geographically different. Households in these areas were categorised into low hybrid maize adopters and high hybrid maize adopters.

N indicates sample size.

Source: IFPRI/RDSB/EPADP/NFNC (1986).

EFFECTS OF CASH CROPPING ON WOMEN'S TIME AND RESOURCE ALLOCATION

The increased emphasis on cash cropping, a characteristic of agricultural policies in Southern Africa, affect nutrition through its impact on women's time constraints and its impact on household income allocation. The pressure to grow more cash crops reduces the availability of household labour to grow household food crops. First, since women have traditionally been responsible for assuring the household food supply, the loss in household food production--as a result of cash crops production--may not be compensated for by increased income from cash crops (Pinstrup-Andersen, 1987).

Second, women are compelled to work on cash crops, which are still largely controlled by men, in addition to working on their own food crops. The increased time constraints experienced by these women have a direct effect on nutrition through changes in child care, breast-feeding, food preparation, and food acquisition behaviour.

Third, since cash crops are labour-intensive and there is lack of sufficient labour-saving devices for women, the amount of time spent working is often increased. Increased labour demand leads to harder work which in turn increases nutritional requirements. If the nutritional requirements are not met by increased food intake, these activities could worsen the nutritional situation of those working women, or of their children, through their effect on time allocation and intrahousehold food distribution.

NUTRITIONAL EFFECTS OF FARM INCOME

Cash crop production can greatly contribute towards increased rural income generation and employment. Cash crops need not have negative effects on nutrition, since acquired income from cash crops can be used to offset the decrease in the availability of household food crops through purchases to meet family nutritional needs. However, household food expenditures and food consumption patterns depend on who in the household controls the income and who decides how the income is spent. Since the production of food for home consumption rests largely with women and the male-controlled cash crops often reduces the production of these crops, then women's control of real income--in terms of food from own production--also decreases. The loss from production of these food crops may not be matched by increased food purchases.

In addition to the control of income, the source and type of household income may also influence consumption patterns and nutrition (Pinstrup-Andersen, 1987). There is strong evidence to suggest that real income, in the form of food from own production (home gardens and household food crops), contribute more to food consumption than an equal amount of cash income (Kumar, 1978). This is because household food crops and cash from home gardening and livestock provide a constant flow of income. In contrast, income from cash crops commonly comes in single, large lumps. As a result, it is not usually spent evenly throughout the year.

Because of the increasing number of female-headed households in rural areas, researchers have begun to recognise the importance of intrahousehold decision making and how this may influence both production behaviour and nutrition. It is well known that female-headed households have less access to male income and may find themselves at a further disadvantage in satisfying labour requirements for certain agricultural tasks. In addition, there is evidence that female-headed households receive fewer agricultural services such as credit and extension support. Since female-headed households are often among the poorest households in the society, they are also the most vulnerable groups to nutritional stress. However, evidence suggests that, in spite of their economic status, female-headed households are often capable of meeting the nutritional requirements of their family members

(Table 3). Women are able to target a large portion of their resources and income towards improving the general welfare in their households (Kumar, 1978). Under these circumstances, it may be possible to improve household nutrition and household welfare if policies are developed which target women's income and production activities--since women are mainly responsible for providing household food.

RESEARCH AGENDA

Current evidence indicates that agricultural policies are strongly biased towards cash crops and the expected gains of this bias, through increased food consumption and improved nutritional status, have often failed to materialise. In order to understand why the socioeconomic status has not improved among the small-scale farmers, there is a need to:

- o identify measures to alleviate seasonal declines in food consumption and nutritional stress;
- o expand research on household (traditional) staple crops and relish food crops, and make these priority areas of future research;
- o develop the capacity to transfer household food crop technology from the research to extension and from extension to farmers;
- o identify the reasons for the existence of malnutrition in hybrid maize surplus areas;

Table 3. Nutritional status (height for age) of children by sex of the household head in hybrid maize adoption areas, Round 1, Eastern Province, Zambia^a.

N = 758	Plateau hybrid maize adoption ^a				Valley hybrid maize adoption	
	Low ^b		High ^b		Low ^b	
	%	No.	%	No.	%	No.
Height for age						
Male-headed households						
≤ 36 months	60	24	54	21	63	5
37-60 months	42	10	65	15	60	6
61-120 months	73	29	71	27	43	6
Female-headed households						
≤ 36 months	39	5	40	4	0	0
37-60 months	43	3	88	7	0	0
61-120 months	33	na	42	na	0	0

^aZ-scores (Std. deviation) ≤ -2 denote malnutrition. The U.S. NCHS reference standards have been adopted. The data indicates the percentage and number of malnourished children. ^bHouseholds in plateau and valley areas were categorised as low hybrid maize adopters and high hybrid maize adopters. Source: IFPRI/RDSB/EPADP/NFNC (1986).

- o assess the impact of cash crop policies on technology adoption, household income generation, and expenditure and determine how these affect levels of food consumption, nutrition, and health; and
- o develop appropriate technology to relieve women from labour-intensive chores that hinder household level food production.

REFERENCES

- Holdsworth, I., J. O'Dea, C. Siandwazi, and D. Kasonso. 1986. *Nutritional impact of agricultural activities in Serenje-Mpika-Chinsali areas*. Integrated Rural Development Programmes, Occasional Paper No. 14. Mpika, Zambia.
- IFPRI/RDSB/NFNC. 1985. *Maize policies and nutrition: Eastern Province*. National Food and Nutrition Council, Lusaka.
- IFPRI/RDSB/EPADP/NFNC. 1986. Quarterly anthropometric surveys, Eastern Province, Zambia.
- IRD/FAO/SIDA. 1980. *Nutrition consideration in agriculture: Eastern Province, Zambia*.
- Milimo, J. and C. Siandwazi. 1988. Gwembe baseline and needs assessment study. Rural Development Studies Bureau, University of Zambia, Lusaka.
- Spurr, G.B. 1984. Physical activity nutritional status, and physical work capacity in relation to agricultural productivity. In: *Energy intake and activity*. Alar R. Liss, Inc., New York, NY.
- Strauss, J. 1986. Does better nutrition raise farm productivity: *Journal of Political Economy* 94.
- Pinstrup-Andersen, P. 1981. The impact of export crop production on human nutrition. In: M. Biowas and P. Pinstrup-Andersen (eds.). *Nutrition and development*. Oxford University Press, Oxford.
- Kumar, K. 1978. *Role of the household economy in child nutrition at low incomes, a case study in Kerala*. Occasional paper No. 95, Cornell University, Ithaca, N.Y.
- Kumar, K. 1987. *Effect of seasonal food shortage on agricultural production in Zambia*. International Food Policy Research Institute. Washington, D.C.
- Siandwazi, C. 1988. Nutritional and health impact of access to technological change in agriculture. In: *Growth and Equity in Zambian agriculture Eastern Province study*. IFPRI/RDSB/EPADP/NFNC, Washington D.C. (forthcoming).



This work is licensed under a
Creative Commons
Attribution – NonCommercial - NoDerivs 3.0 License.

To view a copy of the license please see:
<http://creativecommons.org/licenses/by-nc-nd/3.0/>

This is a download from the BLDS Digital Library on OpenDocs
<http://opendocs.ids.ac.uk/opendocs/>