SOUTHERN AFRICA: FOOD SECURITY POLICY OPTIONS

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MAJOR ISSUES IN DESIGNING A RESEARCH PROGRAMME ON HOUSEHOLD FOOD SECURITY

M. Rukuni and R.H. Bernsten[1]

INTRODUCTION

Over the past decade, the economies in Southern African have experienced difficulties in meeting the food needs of their population. The reasons for household food insecurity include exogenous factors such as drought, high oil prices, and declining terms of trade for cash crops and raw materials; civil strife; lack of appropriate technology; poor performance of supporting research, credit, marketing and extension institutions; and inappropriate agricultural and macroeconomic policies. Morover, under conditions of rapid population growth, pressure is placed on the natural resource base--leading to resource degradation which threatens the sustainability of agriculture in future years (Eicher, 1986; Jayne, *et. al.*, 1987). Due to these factors, the food security of many rural households throughout Southern Africa is at risk.

THE EVOLVING FOOD SECURITY RESEARCH PROGRAMME

In 1985, a Cooperative Agreement between Michigan State University and USAID provided funding to initiate reseach on food security in Senegal, Mali, Somalia, Rwanda, and Southern Africa. The Southern Africa collaborative research program was first established in Zimbabwe with the University and subsequently expanded to support research in Botswana, Malawi, and Tanzania.

Papers presented at the 1986 conference on Food Security in Southern Africa (Rukuni and Eicher, 1986), the evaluation session following the conference, and a regional methodology workshop in March of 1987, identified household food insecurity in low-rainfall regions as a high priority research topic. In response to this assessment, a decision was made to expand the time allotted to household food security issues at this conference.

This session, and the following two sessons, will report on research in progress by SADCC researchers addressing issues of production, income gen-

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eration, and transfer programs to increase access to food by rural households.

This morning's session provides a broad orientation to household food security issues. Zinyama, Campbell, and Matiza will review how African households have historically coped with food insecurity; and how these strategies have become more dependant on the external cash economy. Mushonga will update us on sorghum research in progress in Zimbabwe, collaborative sorghum research under the SADCC/ICRISAT program, and prospects for increasing the productivity of sorghum-based farming systems. Reporting on initial research in low-rainfall districts in Zimbabwe, Mudimu, Mbwanda, Govereh, and Chigume highlight the implications of their findings for future research--emphasizing the need for additional research on small grain and oil seed production; and increasing household and off-farm utilization of small grains. Providing a valuable regional perspective, Norman, Segwele, and Baker report on the results of two decades of research on sorghm-based farming systems research in Northern Nigeria and Botswana.

The papers in the session, Communal Maize Production, Storage, and Marketing in Zimbabwe: Implications for Policy makers, highlight the major contribution of rural income and employment generation to ensuring household food security. Rohrbach reports on factors responsible for tripling maize production in Zimbabwe since 1980. Particularly interesting is his evidence that rural households have not benefitted equally from this increase in production; and that the increase in maize production and marketing has varied widely between regions and household within regions. Stanning's analysis of household grain storage and marketing decisions in surplus and deficit communal areas provides evidence that the level and composition of household grain transactions and income varies considerably between households.

Because of drought, several African countries have institutionalized government food-transfer programs. Two papers will be presented in this afternoon's session on Access to Food. Botswana, now in the sixth year of drought, took a decision in 1979 to develop a permanent institutional capacity to cope with drought and household food insecurity. The important question for conference participants is as follows: Can Botswana's food access programs be replicated in other SADCC countries? Central to this question is the cost of alternative food-transfer programs. Mokobi and Asefa analyze Botswana's experience in meeting both rural and urban food needs during the past six years of drought. Since poverty is a central cause of household food insecurity and malnutrition, Liedholm will present a paper summarizing empirical research on rural nonfarm employment activities as a source of employment and income to purchase more food. Today's sessons will provide an opportunities to jointly share methodologies and results and discuss future research priorities.

ISSUES IN IMPLEMENTING HOUSEHOLD FOOD SECURITY RESEARCH

Several issues must be addressed in developing a household food security research program. In this presentation, these issues are raised as a series of questions. The proposed answers reflect our experience in implementing household food security research and are intended to serve as a point of departure for further discussion.

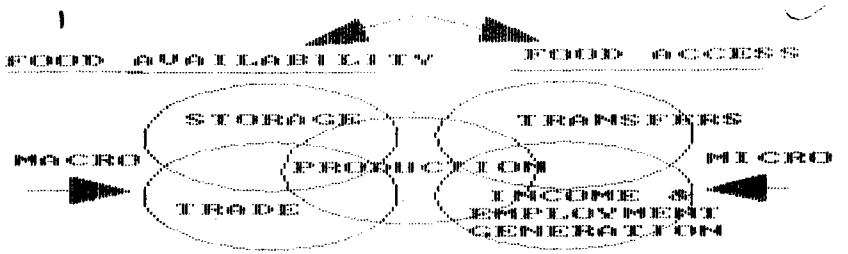
What does household food security mean?

Food security is defined as the ability of all households in a nation to acquire a calorie-adequate diet throughout the year. Food security has two interrelated components: food availability through production, storage or trade; and access to food through production, purchases in the market from income earned, or food transfers (Figure 1).

On the supply side, food insecurity results from the food system's inability to provide an adequate supply of food--both in terms of volume and at an affordable cost. On the demand side, food insecurity arises from the inability of the economy to either provide income-generating opportunities to enable households to purchase in the market or acquire food through transfers.

While food security research may focus on the region, nation, or household; the household food security research perspective places major emphasis on analyzing household data and the performance of institutions in assuring household access to food. Analysis of micro data provides a basis to assess macroeconomic policies on household food security.

FIG. 1 FOOD SECURITY EQUATION



What time period should we consider?

Food insecurity has both short-run and long-run dimensions. Short-run food insecurity results from intra and interseasonal shortfalls in food supplies and effective demand for food. Long-run food insecurity arises from a persistent failure of the economy to assure stable, long term growth in food supplies--especially for nutritionally at risk groups--as population increases and consumer demands change as a consequence of income growth and urbanization.

What are the components of household food security?

Household food security may be conceptualized in terms of a hierarchy of subcomponents. At the first level, access to food depends on households' own production, the availability of income to purchase food, and food transfers (Figure 2). Secondary components of own production include net crop and livestock flows. Secondary components of income generation include sales of farm product (food and cash crops, and livestock) and labor services. Finally, secondary components of food transfers include interhousehold and institutional transfers that provide a safety net for at risk households. A major challenge facing household food security researchers is how to include rural nonfarm activities in our analysis (Leidhold and Mead, 1987). Household strategies for assuring food security are conditioned by households' resource and preferences. External factors influencing these strategies include agroclimatic conditions, technology, institutional performance, and government policies.

Figure 2. Components of Household Access to Food.

FOOD ACCESS COMPONENTS		
Production (net)	**Income Generation**	**Transfers**
Crops	*Farm Sales*	*Inter-household*
o land	o food crops	*Food Aid*
o labor	o cash crops	o food-for-work
o technology	o livestock	o school feeding
o management	*Labor Sales*	o relief
	o non resident	
Livestock	o resident	
	on-farm	
	non-farm	

How do we identify relevant household food security research issues?
Major audience for our research results include policy makers, government administrators, technical scientists, and private sector decision makers. In designing the research, the team consulted with a broad mix of representatives from these groups to insure relevance and involve them in the ongoing research.

What are appropriate research objectives?
Household food security research focuses on both sides of the food security equation: food availability and access to food. The general objective of household food security research is to identify priority farming systems and initiate research to:

- o diagnose the historical and current household food security situation largely through collecting and analyzing household data;
- o describe the agroclimatic and policy environment--particularly technology, institutional, and price policy--that condition existing household resource allocation patterns;
- o identify major technological, institutional, and policy constraints on improving farming systems in low-rainfall regions--including on and off-farm processing;
- o analyze the impact of government policies and programs on food production and access to food; and
- o assess the potential impact of policy interventions to increasing household food security.

How do we insure an efficient research design?
Early in the program, our University of Zimbabwe research team recognized that microeconomic data for analyzing household food security issues were not available. Consequently, the Co-Directors decided to make a major investment in primary data collection. Several research design and management strategies have been used to facilitate efficient project implementation.

Detailed research proposals were developed that included a problem statement, research questions, objectives, methodology, manpower and financial requirements, implementation timetable, and a preliminary list of intermediate working paper. These proposals have served to insure a consistency between research objectives, methodology, and data needs.

The research has been initiated at selected representative sites in target agroecological regions. First, secondary data were reviewed to identify possible sites that met the criteria specified in the research designs, including type of farming system and access to marketing infrastructure. Research sites were selected to represent variations in farming systems and market

access to facilitate comparative analysis of the impact of these situational variables on household food security.

Currently, a team of six researchers is implementing several different but related studies at a common set of research sites. Analysis of subsets of the data is assigned to each participant who will use the data to develop postgraduate theses and dissertations.

How do we gain interdisciplinary research cooperation?

Relevant household food security research requires an input from related disciplines. This input has been provided by agronomists, plant breeders, geographers, agricultural engineers, food scientists and policy makers through seminars and individual consultations. Recently, three geographers have joined the research team and we anticipate expanding the team to include individuals from other disciplines as appropriate opportunities arise.

What are appropriate methods for analyzing household food security?

Several analytical approaches have been used to analyze household food security issues. First, agricultural policies affecting the low-rainfall areas were reviewed. Subsequently, secondary data on production components (area and yield), product marketings, and commodity prices were analyzed to identify trends and to generate hypotheses for further testing at the household level.

Several approaches have been used to evaluate access to food at the household level; and the differential impact of technology, institutions, and price policies across research sites, including the following:

- o Key informant and household surveys were used to collect current and historical cross-sectional data to document the introduction of major technical, institutional, and price policy interventions; and producers' response. Analysis related the timing of these interventions to household resource allocation decisions (adoption of technology and changes in area planted); and the impact of these decisions on crop yields, retentions, marketings, and household income.
- o Crop budgets, based on historical and current input levels, prices, and yields were developed to evaluate the impact of changing relative prices on the economics of household crop production.
- o Household strategies to cope with food insecurity were assessed through direct inquiry; and income data was analyzed to assess the importance of income diversification as a hedge against production risk --including the role of cash crops, remittences, and transfers.

The impact of policy interventions on households were analyzed by quantifying the interhousehold distribution of resources (land, labor and capital),

access to institutional support, and benefits gained as a consequences of policy changes.

PRELIMINARY INSIGHTS ON HOUSEHOLD FOOD SECURITY

Analysis of the Zimbabwe household food security data is still in progress. Initial results--and results from similar studies in progress in Senegal, Somalia, Mali and Rwanda--include the following:

- o While food crop sales are a major source of income in areas studied, remittances, livestock sales and wages from off and nonfarm labor are important income sources. The level and composition of these sources varies greatly between households and regions.
- o Marketed surplus varies considerably between years, regions, and households. In favorable rainfall years, the marketed surpluses stretches the capacity of governments to procure, store, and dispose of these surpluses--particularly for small grains for which there is limited demand at current prices.
- o In drought prone regions, government food-for-work and other food transfer programmes are important sources of food security for the most at risk households.
- o Household access to institutional support which facilitates the adoption of new technology varies between regions and between households in a given region.
- o Unreliable rainfall is a major source of risk. Interyear yield variability is extremely large, even though farmers have adopted coping strategies such as staggered planting, crop mixes, and intercropping to reduce this risk.
- o Farmers have adopted yield-increasing technology (hybrid maize and fertilizer) where, under farmers' conditions, it is profitable. Adoption has lagged, in more risk-prone low-rainfall areas.
- o Household labor is a major production input. Using gross margins per person day as an indicator of profitability, daily returns to labor is quite low--compared to the minimum wage in urban areas.
- o Government policies to support research, strengthen extension services, provide credit to smallholders, extend the marketing infrastructure into the communal areas, and provide farmers with remunerative prices have all contributed to the recent production increases.

FUTURE DIRECTIONS

Household food security research needs to continue its focus on low-rainfall farming systems as these households are at greatest risk. Additional production-oriented research on small grains is needed to improve household food security. The technical, institutional, and policy constraints to increasing cash crop production--especially oilseeds and horticultural crops, as well as small ruminants--should be investigated. Research on small-scale irrigation is needed to assess its potential for providing households with a stable environment for high-value cash crop production. Finally, the role of credit and savings in facilitating technology adoption needs further investigation.

Greater emphasis should also be placed on income and employment generation through the expansion of small-scale enterprises, food processing, and opportunities to add value to raw agricultural products--possibly through expanding poultry or semi-intensive livestock production. As pressure on land resources intensifies, rural off-farm employment generation is critical to dampening rapid urban migration.

Because of the importance of food transfers in providing food security to at risk households during drought years in both Botswana and Zimbabwe, research is needed to determine the most effective ways to identify at risk households and the cost-effectiveness of programs such as food-for-work and school feeding.

Finally, sorghum and millet surpluses call for studies on ways to increase the demand for these grains through increased utilization in poor households, in food-for-work programs, as animal feeds, and in industrial products.

THE CHALLENGE BEFORE US

The papers presented during these sessions will contribute to the debate on relevant research priorities in household food security research. Results presented will show a great deal has been learned about household food security, but that we still have much to learn. Discussion during the coming days will help to refine the household food security research agenda for Southern Africa and move us towards a better understanding of how to insure household food security.

In the coming year, the Food Security Project will to explore opportunities to broaden the community of researchers involved in household food security research. The problem is of critical importance, the issues are numerous, and the challenge is before us.

REFERENCES

Bernsten, R.H. and D. Rohrbach. 1985. Inventory of household level agricul tural and socioeconomic data sets in Zimbabwe: an initial report. Unpublished working paper, Michigan State University, East Lansing, MI.

Buccola, S. and C. Sukume. 1987. Optimal grain pricing and storage policy in controlled agricultural economies: applications to Zimbabwe. Pages 293-321. In: Rukuni, M. and C.K. Eicher (eds.). *Food security for Southern Africa*. UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.

Chaponda, M.A. 1987. Nonfood uses of sorghum. Consultancy report prepared for ICRISAT/SADCC. Bulawayo, Zimbabwe.

Eicher, C.E. 1986. *Transforming traditional agriculture.* Hunger Project Papers. No. 4, The Hunger Project, San Francisco, CA., January.

Gomez. M.I. 1987. The technological status of sorghum as a food grain in Zimbabwe. Consultant report prepared for ICRISAT/SADCC, Bulawayo, Zimbabwe.

Gomez, M.I., M. Mutambenengwe, and H. Moyo. 1987. Research on sorghum and wheat flour composites. Pages 341-350. In: Rukuni, M. and C.K. Eicher (eds.) *Food security for Southern Africa*. UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.

Grain Marketing Board. 1987. Study of Small Grain Stocks. Consultant report prepared for the Grain Marketing Board. Harare, Zimbabwe, April.

House, L. 1987. Sorghum and food security in Southern Africa: present and future research priorities of technical scientists. Pages 329-340. In: Rukuni, M. and C.K. Eicher (eds.). *Food security for Southern Africa*. UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.

Jayne, T., H. Drenge, and J.Day. 1987. Technological change and agricultural productivity in dryland areas of the Sahel (draft). Economic Research Service, USDA, Washington, D.C., February.

Leidholm, C. and D. Mead. 1987. *Small-scale industries in developing countries: empirical evidence and policy implications.* MSU International Development Paper No. 9, Department of Agricultural Economics, Michigan State University, East Lansing, MI.

Makombe, G., R.H. Bernsten, and D. Rohrbach. 1987. The economics of groundnut production by communal farmers in Zimbabwe. Pages 185-215. In: Rukuni, M. and C.K. Eicher (eds.). *Food security for Southern Africa.* UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.

Mudimu, G. 1987. The oilseed subsector and household food insecurity in communal farming areas in Zimbabwe: a preliminary research proposal. Pages 363-375. In: Rukuni, M. and C.K. Eicher (eds.). *Food security for Southern Africa.* UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.

Obilana, A.T. 1987. The sorghum program in Southern Africa: a multidisciplinary and regional approach. Paper presented at the Cereals Research Program of ICRISAT, April 10, Hyderabad, India.

Rohrbach, D. 1987. A preliminary assessment of factors underlying the growth of communal maize production in Zimbabwe. Pages 145-184. In: Rukuni, M. and C.K. Eicher (eds.). *Food security for Southern Africa.* UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.

Shumba, E.M. 1984. A new look at small grain cereals as persistent drought hits the communal areas. *Zimbabwe Agricultural Journal,* Vol. 81(5).

Stanning, J. 1987. Household grain storage and marketing in surplus and deficit communal farming areas in Zimbabwe: preliminary findings. Pages 245-291. In: Rukuni, M. and C.K. Eicher (ed.). *Food security for Southern Africa.* UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.