SOUTHERN AFRICA: FOOD SECURITY POLICY OPTIONS

Correct citation:
Mandivamba Rukuni and Richard H. Bernsten, eds. 1988. *Southern Africa: Food Security Policy Options.* Proceedings of the Third Annual Conference on Food Security Research in Southern Africa. 1-5 November, 1987. University of Zimbabwe/Michigan State University Food Security Research Project, Department of Agricultural Economics and Extension, Harare.

Library of Congress # HD9017.567

ACKNOWLEDGEMENTS

This proceedings of the Third Annual Conference on Food Security Research in Southern Africa is the product of close cooperation between social scientists, technical scientists, government officers, and donor agencies in Southern Africa. The studies reported in the proceedings are part of a comparative analysis of 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 through a sub-contract with Michigan State University.

In the Ministry of Lands, Agriculture, and Rural Resettlement, we acknowledge the generous support provided by Sam Muchena and John Dhliwayo who are responsible for the close collaboration between the food security research project and the SADCC Food Security Technical and Administrative Unit--responsible for developing and managing SADCC's Food Security Programme. They have been particularly helpful in identifying relevant research themes that complement the SADCC programme.

The research supporting the preparation the proceedings papers was 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 a sub-contract with the Department of Agricultural Economics and Extension, University of Zimbabwe. We are grateful to the following present and former USAID officials for their support to the project's efforts to strengthen indigenous research capacity for food security policy research: Don Anderson, Curt Reintsma, Thomas Mehen, Calvin Martin, David Atwood, Ernesto Lucas, Michael Yates, Roy Stacy, Dale Pfeiffer, Pamela Hussey, and Janet Schulman. We are particularly appreciative of the support provided by Allison Herrick, Eric Witt and Joshua Mushauri of the Southern Africa Regional Programme, Harare.

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

We are especially indebted to Mrs. Corinne Smith for her patience, skill, and dedication in word processing the numerous drafts of the chapters included in this proceedings. Her persistence in mastering the word processing and laser printer technology has been exceptional.

Finally, we thank Chris Wolf and Elizabeth Bartilson for providing technical support for the laser printing technology used to print the proceedings.

THE ROLE OF NONFARM ACTIVITIES IN THE RURAL ECONOMY

P. Kilby and C. Liedholm[1]

INTRODUCTION

Until recently it has been conventional to roughly equate the rural economy with the agricultural economy. With from 30-70% of the nation's population, the primary function of rural households was envisioned as the production of food and fibre for the home market and one or more crops for the export market. In addition to farm production, household members might as secondary activities engage in agricultural processing, transporting and marketing.

In the past few years, this view has begun to change with growing recognition that the nonfarm sector plays an important welfare-augmenting role in providing simple consumer goods and services to poorer rural households (Johnston and Kilby, 1975; Mellor, 1976; Chuta and Liedholm, 1979; and Anderson and Leiserson, 1980). Furthermore, the provision of these goods and services provides a humble but critical income to landless labour. But most policy makers still imagine the nonfarm sector as passive--with its size wholly dependent upon the level of farm income and making no independent contribution to economic growth.

This paper draws upon recent research, to delineate the nonfarm rural economy--its magnitude, its anatomy, and how it changes over time. We present evidence that nonfarm activities not only make a major welfare contribution with respect to equity and income-smoothing, but that many of these activities add more to gross domestic product (GDP) than the substitute goods and services supplied by technically-advanced capital intensive producers. Finally, we argue that the sector is no more or less passive than any other sector in the economy, and that it can make substantial contributions to agricultural growth.

SIZE OF THE NONFARM SECTOR

Given that conventional statistical measures of employment and output do not exist for most nonfarm activities, how can we measure the sector's size? There are three ways. First, frequently information is available on occupational classification of the rural population that is collected during the de-

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cennial population census. Second, there are especially-designed establishment surveys within a given sample area. Finally, there are rural household income and expenditure surveys undertaken within the context of a national sampling design.

Census estimates

Table 1 presents mainly census based figures on the share of the rural labour force whose primary occupation lies outside of farming. Although the range runs from 14-49%, in over three-quarters of the countries the nonfarm share is between 19-28%. While this itself is a very large magnitude, it is nevertheless an underestimate (e.g., larger rural towns are excluded, women's nonfarm work is undercounted, secondary occupations--which net out heavily in favour of nonfarm activities--are omitted).

Table 2, showing the composition of nonfarm activities, is also mainly derived from census data. While there is considerable variation between the nine countries, the three major components are manufacturing (including agricultural processing and repair activities), trading, and services. Since trading is the most common secondary occupation, this category is probably understated.

Establishment survey estimates

A second source of information on the rural nonfarm sector is the specially-designed establishment survey. These are generally limited to manufacturing units which, because of their relative fixity of location, are easier to count than concerns engaged in, say, transportation, construction, or petty trade. Table 3, which reports the percentage of total manufacturing employment that occurs in the rural areas, is primarily derived from this type of sample survey. These percentages are usually built up as follows: formal urban employment (plus some large-scale processing employment in rural areas) are obtained from the standard statistical series, to which are added employment estimates for fabricating activities in the urban informal sector with the final component provided by the rural establishment survey.

Are the data in Table 3 to be believed--that in 10 of the 13 countries, rural areas account for over half of manufacturing employment? Like census data, establishment surveys are not entirely reliable with respect to aggregate measurement; but unlike census data, we cannot say whether the result is an overestimate or an underestimate. This type of survey does not capture noncommercial production (for own consumption) and surely overlooks

Table 1. Percentage of rural labour force with primary employment in rural non farm activities.

Country	Year	Coverage	Rural nonfarm labour force (%)[a]
Guatemala	1964	All rural	14
Thailand	1970	All rural	18
Sierra Leone	1976	Male-rural	19
South Korea	1970	All rural	19
Pakistan	1970	Punjab only	19
Nigeria	1966	Male-3 dist. W. state	19
India	1966	All rural	20
Uganda	1967	4 rural villages	20
Afghanistan	1971	Male-Paktia Region	22
Mexico	1970	All-Sinaloa State	23
Columbia	1970	All rural	23
Indonesia	1971	All rural	24
Venezuela	1969	All rural	27
Kenya	1970	All rural	28
Philippines	1971	All rural	28
W. Malaysia	1970	All rural	32
Iran	1972	All rural	33
Taiwan	1966	All rural	49

[a]Percent of rural labour force primarily employed in nonfarm activities.
Source: Chuta and Liedholm (1979).

Table 2. Sectoral composition of rural nonfarm employment in selected countries (%).

	Afghanistan 1970	India 1966	Indonesia 1971	Sierra Leone 1975	Philippines 1970	Korea 1970	Colombia 1970	Malaysia 1970	Taiwan 1966
Manufacturing	46	39	29	40	34	30	33	22	27
Construction	9	14	5	2	11	10	8	5	4
Trade & Comm.	11	14	34	35	15	24	19	22	13
Services	10	24	27	23	30	29	33	41	50
Other[a]	24	9	5	0	10	7	7	10	6
	100	100	100	100	100	100	100	100	100

[a]Includes utilities, transport, and miscellaneous; omits other and unknown.
Source: Chuta and Liedholm (1979).

Table 3. Manufacturing (large and small-scale) employment in rural areas (%)[a].

Country	Year	Percent	Country	Year	Percent
Sierra Leone	1976	86	Philippines	1976	61
Indonesia	1976	80	India	1967	57
Sri Lanka	1971	75	Pakistan	1975	52
Jamaica	1980	74	Taiwan	1976	49
Ghana	1973	72	Malaysia	1970	46
Zambia	1985	64	Korea	1975	30

[a]Rural defined as all localities under 20,000 inhabitants.
Source: Liedholm and Mead (1986).

some out-of-the-way small producers[2]. This source of undercounting can be magnified or reversed by both the particular point in the agricultural cycle that the survey took place (since part-time work constitutes a large share of nonfarm activities) and the geographical areas of the country sampled (since the volume of nonfarm activities typically varies substantially by region). Hence, there is no obvious bias in the estimates reported in Table 3. The likelihood that they are too low is equal to the probability that they are too high.

Specially-designed establishment surveys also provide considerable information about the nature and functioning of the nonfarm sector. While firm size may range over 20 employees, most of these rural nonfarm firms are very small[3]. Liedholm and Mead's (1986) review of evidence from over a dozen countries reveals that 85% of the small rural manufacturing firms employed fewer than five employees with the one-person firm generally dominating. Larger units engage both unpaid family workers and wage-paid employees. Combined fixed and working capital per person is typically modest. Unlike the enumerated wage labour force, women constitute a large fraction--40% or more--of those engaged in the sector and frequently account for the majority of the small-scale entrepreneurs. Acquisition of skills takes place through apprenticeship and other forms of learning-by-doing.

Rural household income survey estimates

Rural household income survey, if constructed for the purpose, provide the most accurate measurement of both employment and output[4]. These surveys

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[2]Comparisons of the street-by-street, village-by-village enterprise censuses, conducted by MSU and host country scholars, with official censuses find that the latter frequently undercount the number of small enterprises by a factor of two or more (Liedholm and Mead, 1986).

[3]Small-scale firms employ less than 50 persons. Rural is localities with 20,000 inhabitants or less.

[4]Similar cost-route surveys to collect weekly data from small firms were conducted by MSU and host country scholars in Sierra Leone, Bangladesh, Jamaica, Honduras, Thailand and Egypt. (Liedholm and Mead, 1986).

are based upon a carefully drawn random sample of several thousand rural households, from whom weekly data is collected over the course of a year--including household receipts by source, expenditures, labour allocation, and a host of supplementary variables. Problems of part-time work, seasonality, overlooked enterprises, secondary occupations--all vanish. The bad news is that such surveys are extremely expensive and require great organizing abilities from the statistical agency in charge. Consequently, this desirable source of information is not often available.

Comparing the nonfarm income share for five countries (Table 4) with primary employment (%) in nonfarm activities (Table 1) reveals that in four out of the five countries, the income share is substantially larger than the primary occupation share. The one exception, Taiwan, is almost certainly the result of the decade discrepancy between the two measurements. If these few figures are indicative, we may tentatively conclude that the nonfarm sector ranges from one-half to three-quarters the size of the agricultural sector. Thus it constitutes a major sector in all low and middle-income economies.

EQUITY IMPACT OF RURAL NONFARM ACTIVITIES

Are rural nonfarm activities a major source of income for the poorest rural households? If so, do they reduce income inequality in rural areas? Do they also contribute to stabilizing income among poorer households over the course of the year? Answers to these questions should provide us with a reasonably comprehensive assessment of the equity issue.

Landholding size and nonfarm activities

Given that land is the farmer's principal productive asset, size of holdings has commonly been used as a variable to stratify rural households into income classes. How important is rural nonfarm income for those with little or no land? Not surprisingly, data from five countries in Asia and Africa (Table 5) reveals an inverse relationship between size of landholding and the share of nonfarm income in total rural household income. For the smallest landholding categories in each country, nonfarm income sources account for over 50% of household income.

Is the income derived from these nonfarm sources sufficient to reduce income inequalities within the rural areas of these economies? For the two African cases, as well as Thailand (Table 5), the nonfarm income sources raise the total income of rural households with the smallest amounts of land to above the incomes of those with somewhat larger farms. This vertical J-shaped relationship between total rural household income and landholdings is perhaps not unexpected in Africa, where land is not a limiting factor. It also

Table 4. Share of nonfarm income in total rural household income.

Country	Year	Percent
Northern Nigeria (3 villages)	1974	28
Korea	1980	34
Sierra Leone	1974	36
Taiwan	1975	43
Thailand	1978	43

Sources: Northern Nigeria: Matlon (1977); Korea: Korea (1981); Sierra Leone: Unpublished results from Sierra Leone African Rural Employment project reported in Chuta and Liedholm (1979), (includes households in rural towns plus in villages); Taiwan: Taiwan (1981); Thailand: World Bank (1983).

appears to hold in some parts of Asia, such as in Thailand and Japan, but it is not ubiquitous (see Korea and Taiwan in Table 5).

However, these general findings, call into question the notion that farm size is a consistently good proxy for total rural household income or a good indicator of who are the rural poor. Indeed, a complex set of factors bearing on farming, nonfarm enterprises and off-farm trading and employment opportunities determine rural household income levels. Although this heterogeneity complicates the task facing policy makers in dealing with the rural poor, it also means that there is a much wider set of opportunities that can be developed.

Nonfarm activities reduce income inequality

Therefore, relating the total nonfarm income share to total rural household income is a better indicator of whether or not rural nonfarm income reduces income inequality. Although information on this relationship is sparse, data are available for Sierra Leone, Nigeria, and Thailand. Table 6, in which rural nonfarm income shares are related to total rural household income quintiles or terciles (from low to high), again reveals the vertical J-shaped

Table 5. Size of land holding and relative importance of nonfarm income in total household income.

Country	Year	Size of holding (acres)	Household income	
			Nonfarm share (%)	Total (US$)
Korea	1980	0.00 - 1.23	74	3,005
		1.24 - 2.47	39	3,450
		2.48 - 3.70	28	4,321
		3.71 - 4.94	23	5,472
		4.95 +	16	7,401
Taiwan	1975	0.00 - 1.23	70	2,768
		1.24 - 2.47	52	3,442
		2.48 - 3.71	44	3,701
		3.72 - 4.94	39	4,570
		4.95 +	26	5,566
Thailand (4 regions)	1980-81	0.00 - 4.10	88	1,362
		4.20 - 10.20	72	974
		10.30 - 41.00	56	1,613
		41.00 +	45	1,654
Sierra Leone	1974	0.00 - 1.00	50	587
		1.01 - 5.00	23	404
		5.01 - 10.00	14	546
		10.01 - 15.00	12	770
		15.00 +	15	927
Northern Nigeria	1974	0.00 - 2.46	57	479
		2.47 - 4.93	31	377
		4.94 - 7.40	26	569
		7.41 - 9.87	15	769
		9.88 +	24	868

Sources: Korea (1981); Taiwan (1977); Northern Nigeria: Matlon (1977); Sierra Leone: Matlon *et. al.*, 1979. The average nonfarm share is lower than that reported in Table 4 because only rural households were interviewed. Thailand: Narongchai, *et. al.* (1983). Some of the villages were chosen because of their varieties of nonfarm activities. Thus, they are not "representative" of the entire country. For the whole country, the nonfarm income share for farm households is 43%. (World Bank, 1983).

Table 6. Percentage of rural household income earned from farm and nonfarm sources by income class.

Country	Income class	Farm	Nonfarm
Sierra Leone	Tercile		
	Lowest	80.3	19.7
	Middle	81.2	18.8
	Highest	80.0	20.0
Northern Nigeria	Quintile		
	Lowest	76.6	23.4
	Middle	78.0	22.0
	Highest	61.4	38.6
Thailand	Quintile		
	Lowest	37.5	62.5
	Middle	44.0	56.0
	Highest	34.9	65.1

Sources: See Table 5.

relationship. Thus, rural nonfarm income is relatively important at both ends of the income distribution spectrum, although different types of nonfarm income are important at the low and high income ends of the distribution. For low income rural household, wages from working on other's farms and service-type activities are the predominant income sources. For the high income households, salaries from administrative and manufacturing activities tend to predominate. These latter activities tend to have higher entry barriers and yield higher returns than agriculture or the other types of rural nonfarm activities (Chuta and Liedholm, 1979).

What is the net effect of these various nonfarm income sources on overall income inequality in rural areas? The results from two African studies as well as from Thailand indicate that including nonfarm income with farm income reduces the rural Gini coefficients in each case.

Gini coefficients calculated on per capita farm income alone were 0.43 in Sierra Leone and 0.32 in Nigeria, compared with coefficients on combined farm and nonfarm incomes (rural) of 0.38 and 0.28, respectively (Matlon *et. al.*, 1979). In rural Thailand, the Gini declines from 0.58 when only farm income is considered to 0.38 when all the sources of the rural households' income are included (Norongchai, 1983). The available evidence, although limited, does suggest that rural nonfarm income reduces rural income inequalities in several countries.

Nonfarm activities smooth annual income flows

Rural nonfarm activities also contribute to the smoothing of household income over the year. For example, analysis of the monthly income fluctuations of 424 rural households in Thailand reveals that the variability of total household income was considerably less than the variability of net farm income over the year (Nonongchai, 1983)[5]. Studies from Northern Nigeria and Sierra Leone point to similar findings, (Matlon, *et. al.*, 1979). Farm and nonfarm activities tend to move in opposite directions over the year and income earned from nonfarm sources complement the pattern of net farm income received. Thus, nonfarm activities seem to make an important welfare contribution with respect to both equity and income stability in rural areas.

EFFICIENCY OF RURAL NONFARM ENTERPRISES

Are these rural nonfarm enterprises efficient users of economic resources? Although, these enterprises seem to possess equity virtues with respect to the distribution of income, they are frequently viewed as inefficient, thus, confronting policymakers with a potentially vexing trade-off. However, if some categories of rural nonfarm enterprises are found to generate more real output per unit of resources expended than their larger-scale urban counterparts, then agricultural and other policies that enhance these activities can increase both output and employment.

Employment would increase if the labour capital ratio of smaller firms exceeded those of the larger ones. Virtually all empirical studies find that small rural enterprises are more labour intensive (usually measured in terms

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[5]The coefficient of variation (CV) for net farm income was 2.07, but only 0.64 for total household income, which includes nonfarm income sources.

of the labour-capital ratio) than their larger scale counterparts in the ag-agregate. At the industry-specific level, the same results generally hold, although a few exceptions exist such as in Korea. (Liedholm and Mead 1986).

Partial efficiency measures

The evidence on the economic efficiency of rural nonfarm activity is rather meagre. Comparisons of small and large-scale enterprises using partial efficiency measures (particularly the output-capital ratio) have been made, but these have yielded a mixed picture of the relationship between capital productivity and size (Page and Steel, 1984; Liedholm and Mead, 1986). Moreover, only rarely are rural and non industrial enterprises specifically examined in these analyses. These studies also suffer from the limitations that surround all partial efficiency measures; if some resource other than the one included in the measure is scarce and thus has a non-zero opportunity cost, then it may yield incorrect results.

Comprchensive efficiency measures

Comprehensive economic efficiency measures, such as total factor productivity and social benefit-cost analysis, overcome the limitations of the partial ones (Biggs, 1986). Ideally, all scarce resources are explicitly included in the analysis and are evaluated at their shadow or social prices that reflect their scarcity values in the economy. Unfortunately, only a few such studies exist (Ho, 1980; Cortes, *et al.* 1985) and none consider rural nonfarm enterprises explicitly.

Relative efficiency

Liedholm and Mead (1986) recently used a social benefit-cost measure to compare the relative efficiency of small rural manufacturing enterprises with their larger-scale urban counterparts in Sierra Leone, Honduras, and Jamaica. Following the approach suggested in Cortes *et al.* (1985), the ratio of the enterprise's value added to the cost of its capital and labour, both valued at

their shadow or social prices, was used to measure economic efficiency[6]. An SBC ratio > 1 means the enterprise has a positive effect on total output of the whole. A ratio of < 1 means it has a negative effect. If domestic rather than social prices are used to evaluate value added, the SBC can only be used to compare enterprises in the same sector.

The primary data used to derive the social benefit-cost ratios were generated from the detailed small-scale industry surveys that Michigan State University and host country researchers had conducted. Approximately 495 rural manufacturing firms were surveyed in Honduras (Stallmann, 1983), 200 in Sierra Leone (Chuta and Liedholm, 1985), and 150 in Jamaica (Fisseha, 1982). Firms were interviewed twice weekly over a 12 month period to obtain daily information on revenues and costs. The information on the large-scale enterprises was obtained from the worksheets used to construct the Industrial Censuses in Sierra Leone and Honduras and from the National Planning agency's Industrial Survey in Jamaica. In calculating the social benefit-cost ratios, the shadow social price of capital was assumed to be 20%, while unpaid family labour was valued at the average price for skilled labour in small-scale industry[7]. Since world prices for outputs and material inputs were not available for the Honduras and Jamaican studies, domestic prices were used. This means efficiency comparisons had to be limited to large and small rural enterprises operating in the same product group with reasonably similar mixes of output and purchased inputs.

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[6]More specifically, the social benefit cost ratios (SBC) is calculated on the basis of the following formula:

$$SBC = \frac{VA}{r_s K + w_s L}$$

where: VA = value added
r_s = shadow or social price (interest rate) of capital
K = total fixed and working capital
w_s = shadow or social price of labour
L = total labour hours, including family and apprentice hours.

[7]The actual wages paid to all workers in large-scale enterprises were included at 80%. (Haggblade, Liedholm and Mead, 1986).

Key findings

The key finding from this three-country analysis is that in a majority of the industry groups considered, the small manufacturing enterprises used fewer resources per unit of output than their larger-scale counterparts. Table 7 reveals that the social benefit-cost ratios are higher for rural small-scale enterprises in 8 of the 12 cases examined. Only in the wearing apparel industries of Jamaica and Honduras and the shoe and furniture industries of Sierra Leone, do the larger-sized enterprises prevail. Moreover, the social benefit-cost ratios for small rural nonfarm enterprises exceed one in all but two industries. Such findings provide limited support for the contention that some small rural nonfarm activities in developing countries are economically efficient. Ho (1980) for Korea and Cortes *et. al.* (1985) for Colombia find that large-scale enterprises tend to be more efficient than their smaller-scale counterparts, using comprehensive efficiency measures. However, they do not explicitly consider rural activities.

One weakness of this analysis is that output and purchased inputs were valued using domestic, rather than world prices. Fortunately, sufficient data were available from Sierra Leone to compute enterprise social benefit-cost ratios at world prices.

This analysis, summarized in Table 8, reveals that at world (social) prices small-scale manufacturing enterprises in Sierra Leone are more efficient than their small-scale counterparts in all enterprise groups considered, except for shoes. The aggregate social benefit-cost ratio for rural small-scale industries is +1.57, indicating that small industries, overall, are economically efficient and have a positive effect on the total output of the Sierra Leone economy. Moreover, except for furniture, the ratios for the individual industries all exceed one, indicating their positive contributions to the economy as well. By contrast, the social-benefit cost ratios for large-scale industry is 0.49 overall, and exceeds one in only a single industry group, shoes. The large-scale activities, consequently have a negative effect on the Sierra Leone economy. Thus, a shift of resources to rural small industry would appear to make economic sense.

EFFECT OF EXPENDITURE PATTERNS ON SIZE OF THE RURAL NONFARM ECONOMY

What determines how large the rural nonfarm economy is in a given country and what are its likely growth prospects? This can be approached by examining the expenditure patterns for goods and services that this sector could supply; and analyzing the supply response of rural nonfarm enterprises.

Table 7. Social benefit cost ratios (domestic prices)[a] for various large and rural small-scale industry groups in Sierra Leone, Honduras, and Jamaica.

Country/enterprise/group	Year	Rural small-scale[b]	Large-scale[b]
Sierra Leone	1974-75		
Bakery		1.86	1.03
Wearing apparel		1.78	0.53
Shoes		1.65	2.00
Furniture		0.81	0.87
Metal products		1.63	1.61
Honduras	1979		
Wearing apparel		0.82	0.89
Shoes		1.27	0.54
Furniture		1.44	0.84
Metal products		1.21	0.74
Jamaica	1979		
Wearing apparel		1.00	1.79
Furniture		2.51	1.36
Metal products		1.87	1.58

[a]Gross output and purchased input values used to compute value added (numerator) are evaluated at domestic prices; hired labour valued at actual wages paid for small and at 0.8 of actual wages for large. Unpaid family valued at skilled wage rate for small-scale industry. Capital was evaluated at a shadow interest rate of 20%. For a rationale for these particular shadow rates, see Haggblade, Liedholm, and Mead (1986). [b]Small-scale firms employ less than 50 persons. [c]Large-scale firms employ 50 persons or more. With one exception, these firms are located in large urban areas.

Source: Sierra Leone: small-scale enterprise date, Chuta and Liedholm (1985); large-scale data from worksheets used to generate Census of Manufacturing figures of Central Planning Unit, Government of Sierra Leone, 1974-75. Honduras: small-scale enterprise data, Stallman (1983); large-scale industry data obtained from worksheets used to construct the 1975 Census of Industry. Jamaica: small-scale enterprises data, Fisseha (1982); large-scale data collected from worksheets used by the National Planning Agency for their 1977 industrial survey.

Table 8. Social benefit-cost ratios large-[a] and rural small-scale[b] manufacturing enterprises 1974-75, Sierra Leone.

Industry	Domestic prices[c]		World prices[d]	
	Rural Small Scale	Large Scale	Rural Small Scale	Large Scale
Food				
Bakeries	1.86	1.03	1.80	0.68
Beverages	e	1.79	e	0.89
Others	e	4.41	e	-2.46
Textiles				
Wearing apparel	1.76	0.53	1.38	-0.30
Gara cloth	4.82	e	3.68	e
Shoes	1.65	2.00	1.14	1.40
Wood				
Furniture	0.81	0.87	0.52	0.48
Metal				
Metal products	1.63	1.61	1.16	0.90
Repairs	4.78	e	4.78	e
All	1,94	1.74	1.57	0.49

[a]Large firms employ 50 or more persons; [b]Small firms employ less than 50 persons; [c]For the social benefit-cost ratio, the gross output and purchased input values used to compute value added (numerator) are evaluated at actual prices in Sierra Leone; hired labour is evaluated at the market wage for small and at 0.8 of actual wage for the large; apprentice labour is evaluated at Le 0.06/hour and family labour at Le .16/hour; capital is evaluated at 20% using the capital recovery factor for the fixed component; [d]For the social benefit-cost ratio (world prices), the gross output and purchased input values at domestic prices were adjusted from the nominal tariffs on imported elements. Where quantitative restrictions applied, such as for flour, the difference between c.i.f. import prices and domestic prices were used. [e]Data not available.

Sources: Small-scale enterprise data reported in Chuta and Liedholm (1985); large scale enterprise data obtained from Census of Manufacturing data collected by Central Planning Unit, Government of Sierra Leone 1974-75. Data were obtained from 15 of the 28 large industry; these firms accounted for over 90% of the large industry value added. Customs data obtained from the government. Specific tariffs converted to ad valorem rates based on current f.o.b. prices.

Consumer goods and services

We begin with the best documented and largest class of expenditures, namely consumer goods and services. Although rural household expenditure studies are not uncommon, they typically do not distinguish the source of various consumption goods (e.g., whether the shoes purchased were made overseas, in a major urban area, or in the rural economy). Investigations which do draw this distinction have been carried out in Sierra Leone (King and Byerlee, 1978), Nigeria, and Malaysia (Hazell and Roell, 1983).

In these countries, the combined budget share of food expenditures (including alcohol and tobacco) ranges from two-thirds to four-fifths of household spending (Table 9). This, of course, reflects modest levels of per capita income in all rural economies. The lesser reliance on home-produced food in the Muda area of Malaysia and the greater reliance on food imported from outside the region are the joint effect of higher income level and more specialized agriculture.

Among the goods and services that make up the local nonfood category are tailor-made clothing, footwear, hats, wooden furniture, pottery, and mats; firewood; schooling and medical care; domestic servants, laundering, and hairdressing; films, eating and drinking out; repairs, improvement and construction of homes; public transport and the operation of own transport.

In all three countries, this local nonfood category has the highest expenditure elasticity. This means that a 10% increase in household income in Sierra Leone will lead to a jump in spending on local nonfarm goods and services equal to 14%, to a 13% increase in the Gusau region of Nigeria, and to a 20% increase in Muda. Thus, we have strong evidence that rural nonfarm goods and services are not inferior, but rather have the potential to grow more rapidly than agricultural itself, providing an expanding share of all rural employment.

Individual components of the nonfarm category have sharply differing expenditure elasticities. The highest elasticities are associated with services. Thus, in Sierra Leone the figure for transport is 1.38 and for personal services and ceremonial outlays, 2.38. By contrast, the elasticity for manufactured products originating from small-scale producers is 0.86. In Gusau and Muda the figures for housing construction and repair are 1.40 and 3.02; and for transportation, 1.67 and 1.48.

Elasticities for specific manufactured goods for Sierra Leone and Bangladesh are shown in Table 10. The Bangladeshi households, at a per capita income of about US$100, are the poorest of the four countries and, presumably, have the smallest budget shares devoted to nonfood items. Both countries have higher income elasticities of demand for rural based production, relative to the products of large-scale urban industry.

Table 9. Rural expenditure elasticities in three countries

Item	Average budget share			Expenditure elasticities		
	Sierra Leone[a]	Nigeria[b]	Malaysia[c]	Sierra Leone[a]	Nigeria[b]	Malaysia[c]
Own food	47	56	27	0.87	0.88	0.37
Local food	21	19	19	1.06	1.09	0.76
Imported food	NA	5	21	-	1.07	0.65
Local nonfood	9	9	18	1.40	1.34	2.05
Imported nonfood	NA	11	15	-	1.16	1.66

[a]Sierra Leone: a national sample 1974, N = 203. [b]Nigeria: the Gusau region 1977, N = 321. [c]Malaysia: the Muda region 1973, N = 839.
Sources: Sierra Leone: King and Byerlee (1978), p. 204; Nigeria and Malaysia: Hazell and Roell (1983), p. 28.

Growth in farm and nonfarm rural employment has followed the pattern predicted by these expenditure elasticities. However, the composition of nonfarm activities likely differ from that suggested by the elasticity coefficients. Expenditures on rural manufacturers will be lower and expenditures on services (particularly trade and transportation) will be higher than predicted.

Beginning with manufacturers, the initial range of a rurally supplied good will be larger or smaller, depending upon craft traditions and the entrepreneurial endowment (e.g., it tends to be larger in Asia than in Africa). But in all countries, as per capita income rises, there is a shift in location from village to regional town and metropolitan area. Although the rural producer has an advantage in less expensive labour and premises, improving rural roads progressively diminish the natural protection he enjoys against urban

Table 10. Expenditure elasticities of rural households for various small and large enterprise products, Sierra Leone and Bangladesh.

Products	Sierra Leone[a]	Bangladesh[b]
Food		
Bread - small	+0.69	+1.14*[c]
Clothing		
Dresses and pants		
Tailoring, small	+0.72*	+0.96**
Clothing, large	+0.59	[d]
Imported	+1.49	+0.29
Lungi		
Small	[d]	+1.61*
Large	[d]	+1.00*
Sari		
Small	[d]	+2.00*
Large	[d]	+0.63**
Synthetic, large	[d]	+1.74*
Wood		
Furniture, small	+1.61*	+2.00*
Metal		
Agricultural tools and utensils		
Small	+0.50	+1.06*
Large	+0.89	+1.29*
All small-scale industry[e]	+0.76*	[d]
All large-scale industry[e]	+0.33	[d]

[a]In Sierra Leone, data (1974) from 203 rural households were fitted into a modified form of a ratio semilog inverse expenditure function. [b]In Bangladesh, data (1980) from 444 rural households were fitted into a semilog expenditure function with the values in table estimated at mean expenditure levels. [c]* estimated coefficients significant at 1% level; ** estimated coefficients significant at 5% level. [d]Data not available. [e]From King and Byerlee (1978).
Sources: Sierra Leone: King and Byerlee (1977); Bangladesh: BIDS (1981).

towns where the larger markets promise higher returns; and greater availability of more skilled labour and of cheaper, more diverse raw materials. Production in the towns, while carried out in units four or five times the size of the rural producer, is still comparatively small-scale and labour intensive.

To the extent large-scale public investment builds up the infrastructure of regional towns, many entrepreneurs will locate here and the output is not lost to the larger rural economy. But to the extent entrepreneurs migrate to the urban areas and urban based substitute goods--plastic utensils, synthetic textiles--replace traditional products, the demand for rurally-produced manufactured good will fall. Because these changes--along with other shifts in taste and relative prices--occur over time, they are not picked up in cross-section expenditure surveys. Hence, the latter's expenditure coefficients are an overestimate.

Expenditure studies may also underestimate nonfarm transport and trading activities, since most are embedded in the price of the consumer goods. If there is a shifting away from village-produced goods to more distant sources, the share of marketing services will rise. Hence, inferences from household expenditure patterns may underestimate the growth in aggregate rural nonfarm services.

Forward and backward linkages

The two remaining, smaller categories of expenditures pertaining to nonfarm activities are production outlays on farm inputs (backward linkage) and expenditures on processing and marketing of agricultural output from the farm (forward linkage). Production inputs (e.g., cement for irrigation works; fertilizer, typically the largest single input expenditure; other agricultural chemicals; and four-wheel tractors) do not originate in the rural economy. Also, agricultural products are partially processed in urban areas. One of the few studies that netted out intersectoral purchases (Bell, Hazell, and Slade, 1982) for Muda found that one-third of the incremental income was due to backward and forward linkages, whereas two-thirds was attributable to consumption expenditures.

While localized forward linkages give rise to considerably more value-

added than the comparable agricultural inputs[8], the latter--particularly farm equipment--play a unique role in their potential impact on agricultural productivity. Other nonfarm activities such as trading and transport stimulate farm output by reducing marketing costs, which leads to an outward shift in farm level demand. On the other hand, farm equipment inputs directly increase yield per acre and output per person.

There are two components to the nonfarm sector's productivity contribution to agriculture. The first is related to the rural farm equipment industry's capacity for idiosyncratic design adaptation. In the animal draft farming sector of many Asian, African, and Latin American countries; three or four types of ploughs are used, both for breaking the soil and for secondary tillage. In Taiwan, local blacksmiths have provided farmers with a wide array of cheap, highly-specialized implements. Primary tillage to one side, one of eight secondary tillage implements is the harrow. There are 11 kinds of harrows: the comb harrow, three knife-tooth harrows (standard, bent frame, flexible tooth), two spike harrows, the bamboo harrow, the pulverising roller, the stone roller, the tyned tiller, and disc harrow. The standard knife-tooth harrow has 12 regional variants; width, length, material, number of teeth, shape of tooth blade, and method of affixing teeth are adapted to local topography, field size, soil structure, and available construction materials.

Idiosyncratic design adaptation enables farmers to complete a task--in this case secondary tillage--more quickly (higher labour productivity) and more effectively (higher land productivity). More dramatic, better known examples of idiosyncratic design adaptation include India's portable irrigation

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[8]A good overview of specific production inputs and processing activities is available for Thailand (World Bank, 1983). The share of all manufacturing value-added deriving from rice milling, rubber processing, cassava chipping, tobacco curing, and fruit canning that takes place in rural areas is many times larger than that of farm equipment and animal feed. For a more general treatment of the relative size of forward and backward linkages over the course of economic development, see Simantov (1967).

pump, based on vertical high-speed diesel engines made in small engineering workshops; and Thailand's Prapradaeng power tiller[9].

These last two examples also illustrate the second way that rural farm equipment producers raise agricultural productivity--by supplying inexpensive partial mechanization inputs which break labour bottlenecks and thereby pave the way to higher cropping intensity. Additional examples include small electric or gasoline pumps, small motors attached to threshers and winowers, and backpack sprayers which increase output per acre per year and labour income through higher utilization of manpower over the entire year.

In summary, the rural nonfarm sector stimulates agricultural output in three ways: through substantial income effects on food expenditures, through reduction of marketing costs, and through the productivity contribution of localized farm equipment manufacturers.

SUPPLY RESPONSE TO INCREASING DEMAND

The extent to which the increase in demand described above will translate into an expansion in rural nonfarm output depends on the supply response. In the short-run, this depends on the amount and source of the excess capacity of existing firms. In the long-run, the key determinant is the barriers constraining the expansion of existing firms or the entry of new firms. The current and prospective relative efficiency of substitute goods from sources external to the rural area is also of critical importance as discussed above.

Short-run excess capacity

With respect to the short-run supply response, available evidence indicates that there is substantial excess capacity among the rural nonfarm enterprises in many developing countries. Excess capacity measures are difficult to precisely quantify and studies in developing countries are particularly sparse, usually limited to larger urban firms (see Bautista, 1981, for a discussion of

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[9]The case of the power tiller in Thailand is instructive. Japanese power tillers for paddy cultivation had not been widely adopted owing to high purchase price. A low-cost adaptation, developed by IRRI in the Philippines, was introduced in the late 1960s; it did not succeed. The Prapradaeng tiller was developed locally and improved through a prolonged iteration between local farm users and the equipment producers--the forcing house of successful appropriate technology--and is now manufactured by more than 40 small firms.

these studies). However, surveys of small rural manufacturing firms conducted by Michigan State University and host country researchers in five countries have generated some information on many facets of their operation, including excess capacity (Leidholm and Mead, 1986; Kilby and D'Zmura, 1985). On the basis of the responses of rural entrepreneurs to the question of how many additional hours they would operate their existing firms if there were no demand or materials constraints, the estimates of overall excess capacity ranged from 18% in Egypt, 24% in Honduras, 35% in Jamaica, 37% in Sierra Leone, and 42% for rural manufacturing firms in Bangladesh (Liedholm and Mead, 1986). Excess capacity varied between industries and by location in each country, but rarely declined below 10%; virtually no small rural firms in these countries operated on more than a single shift.

Demand factors

What was the primary source of this excess capacity? The limited survey evidence indicated that rural entrepreneurs perceived that demand factors were more important than supply ones. In Jamaica and Sierra Leone, the only two countries in which the question was asked, over 80% of the entrepreneurs reported that the lack of demand was the primary source of their excess capacity. In such cases, demand-stimulating policies play a central role.

Supply side

Raw materials and working capital. On the supply side, lack of raw materials and working capital were the most frequently cited sources of excess capacity. A common cause of raw material shortage for small rural firms is the country's foreign exchange regime, which discriminates against the small producer (Haggblade, Liedholm, and Mead, 1986). The other major factor cited was a lack of working capital, generally the largest component of total capital for small enterprises. These shortages often occur at intervals over the course of the year. The primary external source of funds is advance payments by customers, rather than commercial banks or even the informal market (Kilby, Liedholm and Meyer, 1984). Although internal cash flow generated by the firm tends to predominate, funds also arise from other rural household enterprises[10]. In contrast to specialized farming households, the

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[10]For a discussion of the new agricultural household models, which include multiple activities but also the integration of consumption and production activities, see Singh, Squire and Strauss (1986).

pattern of cash flows for rural households that also undertake nonfarm activities is different. This facilitates internal cross finance that reduces recourse to external borrowing. Meyer and Alicbusan's (1984) study of the cash flow of a sample of Thai rural households revealed that nonborrowing households were more heavily engaged in nonfarm activities than borrowing households.

Labour. On the other hand, labour is generally not a binding short-run constraint for rural nonfarm activities. The dominance of the seasonal agricultural demand for labour is of key importance in understanding rural labour activity. Yet, one must be careful not to treat farm and nonfarm employment as separate entities. Policy interventions must consider the very close, often symbiotic, relationship between these two labour categories over the agricultural cycle. The empirical evidence indicates that in most countries nonfarm activities continue throughout the year. Thus, nonfarm employment competes somewhat with agricultural employment during peak farm labour demand periods. However, since over the seasons, farm and nonfarm employment move in opposite directions, they are highly complementary. For instance, data from Sierra Leone (Byerlee, *et. al.*, 1977) reveal that during the slack agricultural months nonfarm labour use is nine times the use in peak agricultural periods. The fluidity of labour between several activities on a seasonal basis serves to reduce overall variability of labour use over the year. For example, in a study of four regions of Thailand, the coefficient of variation (CV) in rural households' use of farm labour over the year was 0.56, but declined to 0.21 when nonfarm activities were included (Narongchai *et al., 1983).* Similar reductions in the CV are found in studies conducted in Sierra Leone, Northern Nigeria and Malaysia (Barnum and Squire, 1981). In summary, the magnitude and causes of the excess capacity observed in most rural nonfarm activities indicates that a significant short-run supply response is likely.

Long-run barriers to entry

In the long run, the barriers to entry can influence the supply response of rural nonfarm enterprises--particularly capital, skill, and entrepreneurial constraints.

Initial capital constraint

How significant are the capital constraints? The empirical evidence indicates that such barriers for most rural small enterprises are low, but not insignificant in some instances. The initial capital requirements reported in most studies of rural manufacturing enterprises appear quite small, ranging from US$50 in rural Sierra Leone, US$839 in rural Bangladesh, to US$1,066 in

rural Jamaica (Liedholm and Mead, 1986). However, in relation to average incomes the capital barrier is quite large in some countries. For example, in Bangladesh, the US$839 overall initial capital requirement is almost six times the country's per capita income. These figures also mask the wide variations in initial capital requirement by type of small enterprise. In Bangladesh, new jute baling firms required over US$13,000 in initial capital, while only US$6 was required for new rural mattress enterprises (B.I.D.S., 1981). There is also limited evidence that these barriers are higher for manufacturing than for most unskilled service and petty trade activities. For instance, Fisseha's (1986) recent survey of forest based activities in rural Zambia reveals that the initial capital requirements for the major manufacturing activities were five times those for the service-related ones. The funds needed to either create or expand these enterprises are overwhelmingly obtained from personal savings, gifts, and informal loans from family or relatives. Studies from Sierra Leone, Haiti, Bangladesh, and Jamaica indicate that over 80% of the initial capital for rural manufacturing firms come from these internal sources, while about 90% of the funds used for expansion are reinvested profits. They have little access to formal credit sources, partly traceable to policy discrimination against small firms (Haggblade, Liedholm, and Mead, 1986), and rarely do they use the informal credit market. Thus, lack of capital appears to act as a partial barrier to the entry of new firms into some types of rural nonfarm enterprises. However, generally these barriers are not unduly high, so they should not seriously constrain the expansion of these activities.

Human capital constraint

What of the human capital constraints that might limit an expansion of rural nonfarm firms? Evidence from various small rural enterprise surveys indicates that formal educational barriers to entry are low. However, in many countries, the informal apprenticeship system or on-the-job training play a key role in skill formation. The proportion of rural manufacturing proprietors who were apprentices or on-the-job trainees was 90% in Sierra Leone, 75% in Jamaica, 52% in Honduras, and 50% in Egypt (Liedholm and Mead, 1986). The period of informal training which defines the length of the gestation period for new capacity varies markedly by type of enterprise. For example, in Sierra Leone, it varies from one year in gara (tie-dying), to four years in metal working; while in Egypt the training period ranged from one month in hat-making to three years in shoe-making (Davies, *et. al.*, 1984). In general training is a more significant entry barrier in manufacturing than in petty trades or simple service activities. Fisseha (1986) reports that in rural Zambia only 16% of the service and vending entrepreneurs had training, compared to 82% for manufacturing entrepreneurs.

In summary, all the ingredients are present for a highly competitive system that responds quickly to changes in consumer demand. The expansion sequence is as follows: an increase in demand leads to a price rise which in turn widens entrepreneurial earnings, thereby attracting a larger supply of apprentices and soon-to-be independent producers. Internal sources provide the capital to expand capacity, which drives down prices and profit.

GROWTH IN RURAL NONFARM ACTIVITIES

Has rural nonfarm activity, in fact, been increasing over time? Aggregate statistics indicate that it generally has. Anderson and Leiserson's (1980) analysis of ILO secondary data, showed that between 1959 and 1970, the employed rural labour force increased faster than the agricultural labour force in all regions except Latin America. Specific data for nine countries reported by Chuta and Liedholm (1979) reveal that the percentage of the labour force engaged in nonfarm work has risen in all of them. They also report the following annual growth rates in nonfarm rural employment: Korea 1960-74 at 3.2%, Taiwan 1955-66 at 9.4%, Kenya 1969-75 at 8.8%, Mexico 1960-70 at 5.6%, Iran 1956-72 at 4.8% and Indonesia 1961-71 at 5.5%.

There are important variations in the growth rates by type and size of enterprise. For example, time-series data on differential rural growth rates by firm size are sparse, but limited information on rural industrial growth rates are now available for firms employing from 1 to 50 persons in India (1961-71) and Sierra Leone (1974-80) (Liedholm and Mead, 1986). These data indicate a direct relationship between the growth rates and firm size. For example, in both countries, the growth in the number of rural industrial firms is highest in the 10 to 49 employee size category and lowest in the one-person firm category. Indeed, in Sierra Leone, the number of one-person rural industrial firms actually declined during the period covered by the study. Such findings tend to reinforce Anderson's (1982) conclusion, that household manufacturing for the country as a whole "tends to decline first in relative and then in absolute terms as industrialization proceeds." Moreover, the growth rates were higher the larger the size of locality and thus, reflect the shift to provincial towns noted above.

CONCLUSION

Nonfarm activities productively absorb a large quantity of rural labour and provide a major source of income to a majority of rural households. Because they are the source of a particularly large share of sustenance to the rural poor, they have a substantial impact on reducing income inequality. An exclusive focus on land reform as solution to rural poverty is mistaken.

Finally, nonfarm activities are not only efficient contributors to GDP, but they stimulate agricultural growth through effects on income, farm productivity, and marketing costs.

Differing public policies will result in a larger or smaller rural nonfarm economy. The redirection of large-scale public expenditures towards the development of infrastructure in rural towns is one potent intervention available and is highly desirable on other grounds. A second area is the creation of a general policy environment that is at least neural with respect to the size of enterprises (Haggblade, Liedholm, and Mead, 1986). For instance, implicit tariffs on tools and equipment, raw materials, and spare parts should not be higher for smaller firms than for larger firms as is true in many countries. In addition, given the strong linkages, policies aimed at increasing agricultural output are relevant to raising nonfarm output and employment. At the project level, the new lending modalities for channeling working capital to micro-enterprises should be pursued (Kilby and D'Zmura, 1985). Finally, the strength of the nonfarm sector depends upon the infusion of the new technical knowledge. Research and development expenditures need to be aimed at design upgrading of farm equipment, transportation vehicles, and traditional consumer products; best-practice surveys and adaptive research are needed to improve existing artisan production processes. In all probability these steps will only be taken when those in power are more fully informed of the size and potential contribution of the rural nonfarm sector and then are willing to commit themselves to the potentially hazardous task of mobilizing new constituencies and placating the old.

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