

DISCUSSION PAPER

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Farm/Non-Farm Linkages in Rural Sub-Saharan Africa:
Empirical Evidence and Policy Implications

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I. INTRODUCTION¹

Based largely on evidence from Asia, Johnston, Kilby, and Mellor advocate a rurally oriented development strategy driven by growth in small farmer agriculture (Johnston and Kilby, 1975; Mellor, 1976; Mellor and Johnston, 1984). They argue that a small farmer strategy will generate rapid, equitable and geographically dispersed growth because of substantial, labor intensive linkages with the rural nonfarm economy. Using examples from India, Pakistan, and Taiwan, Johnston and Kilby (1975) highlight the potential importance of production linkages. In addition to farmer demand for fertilizer and construction inputs, they emphasize the importance, for the rural economy, of other backward linkages from small farm agriculture to local blacksmiths and equipment suppliers.

¹We would like to thank the many individuals who assisted us at various stages in producing this report. Ram Agarwala, Dennis Anderson, Hans Binswanger, Eric Crawford, Bill Jaeger, Peter Kilby, Carl Liedholm, Peter Matlon, John Page and Thelma Triche all assisted in identifying promising veins of both data and relevant analysis. We likewise benefitted early on from discussions with Stanley Please, Ram Agarwala and the entire convened staff of the Special Office for Africa (SOA). Because the data demands of this study were considerable, we are particularly grateful to Yacob Fisseha, Peter Kilby, Carl Liedholm and Chris Windheuser, all of whom made special efforts to assist us in procuring elusive data. In helping sift and shape a large body of information, Nandinee Kutty and Kwesi Amisshah provided invaluable research assistance. Carl Liedholm and Vijay Vyas both pored over our ponderous initial draft, offering incisive commentary and helping us to clarify our presentation and thinking in countless ways. To all we issue our thanks as well as absolution from any implication in remaining errors of fact or interpretation. We alone shoulder responsibility for what remains.

But farmers also purchase consumer goods. Mellor (1976) and Mellor & Lele (1973), in particular, have called attention to the potential power of agricultural consumption linkages. Drawing on Indian data, they conclude that middle-sized peasant farmers - to a much greater extent than their large scale and urban counterparts - spend incremental income on labor-intensive rurally produced goods, thereby generating important second-round demand multipliers. Hirschman's (1959) early indictment of agriculture as a low-linkage, underpowered engine of growth erred, according to Mellor (1976), because it ignored these important agricultural consumption linkages.

Several empirical studies have documented the power of farm-nonfarm linkages in Asia. Based on data from India, Rangarajan (1982), Mellor and Lele (1973), and Mellor and Johnston (1984) estimate economy wide agriculture-to-nonfarm income multipliers to be in the range of about .7. And Bell, Hazell and Slade (1982), examining exclusively rural growth linkages in the Muda River Region of Malaysia, compute an agriculturally induced rural nonfarm income multiplier of .8. Employment multipliers are also substantial. Evidence from the Philippines (Gibb, 1974) and India (Krishna, 1976; Mellor and Mudahar, 1974) places agriculture-to-nonfarm employment elasticities between 1 and 1.3. Although decomposition of the growth multipliers is rare, Bell, Hazell, and Slade (1985), in their Muda study, do provide a breakdown, estimating the consumer demand generated by agricultural growth to be double the production linkages. They provide, thus, the major empirical testament to the relative power of consumption linkages.

As the world turns its attention to Sub-Saharan Africa, government leaders and donors alike view small farmer agriculture as the necessary centerpiece of development attention. Equity, nutrition and poverty considerations argue persuasively for such a focus. In addition, many would like to believe that a small farmer strategy will generate maximum growth rates, Asia-style, through linkage multipliers with the rural economy.

But no one has yet marshalled the empirical evidence necessary for assessing the power of agricultural growth linkages in Africa. It may now be possible to do so given the accelerating accumulation, over the past 20 years, of a body of detailed survey work examining the structure of Africa's rural nonfarm economy (Kilby, 1962, Liedholm, 1973; Steel, 1977; Chuta and Liedholm, 1979; Page, 1979; Anderson and Leiserson, 1980; Page and Steel, 1984; Liedholm and Kilby, 1986; Liedholm and Mead, 1987). This paper aims to examine that evidence in order to assess the nature and magnitude of farm-nonfarm links in rural Sub-Saharan Africa. First, the paper will systematically review empirical evidence on the structure of the African rural nonfarm economy. It will then examine changes over time, as well as differences across countries, in an effort to assess quantitatively the magnitude of the agricultural growth multipliers in Africa. The paper concludes with a brief review of policies and programs that will be necessary in achieving maximum farm-nonfarm growth linkages.

II. PROFILE OF THE RURAL NONFARM SECTOR

A. Definitions

Before embarking on a review of rural nonfarm activities, it is helpful to specify what we mean by both "rural" and "nonfarm". Nonfarm activities are easier to pinpoint. They are taken to include all economic activity apart from crop and livestock production. Thus nonfarm activities encompass services, construction, mining, commerce, and manufacturing. They include agroindustries which transport, process, package or distribute agricultural commodities.

Some studies make a different distinction - between "on-farm" and "off-farm" activities. Analysis of this type includes in off-farm work all economic endeavor a person engages in outside the confines of his or her own fields. Thus "off-farm" activities include agricultural wage labor on other peoples' farms, wage labor in manufacturing, commerce or services, as well as any owner operated nonagricultural activities. This review is primarily concerned with the conceptual distinction between agricultural and nonagricultural activities. Consequently, where possible in using these studies, we separate out the nonfarm, that is the nonagricultural, from the agricultural component of off-farm work.

Conceptions and definitions of rural vary dramatically, as Anderson and Leiserson (1980), in particular, have emphasized. Certainly the transition from rural to urban traverses a continuum of settlement patterns, population and functional densities, making any attempt to partition the universe necessarily arbitrary. Although the United Nations has defined as

"rural" any settlement under 20,000 in population (United Nations, 1969), few African countries have adopted that standard. Many include a mix of locality size and economic characteristics in their official definitions leading to a range of locality size cutoffs ranging from as small as 150 person settlements in Zimbabwe's 1969 census definition to implicit cutoffs as high as about 10,000 person agglomerations in Mauritania and Benin. As the notes to Table 16 indicate, official African government definitions of rural normally include localities up to about 3,000 to 5,000 in population.

In practical terms, the definition is important, because the density of nonfarm activities changes dramatically with size of locality. So arbitrary differences in definitions of rural can lead to measurement of apparently widely different nonfarm employment densities, even in identical economies.

Conceptually, we prefer to think of rural as depending on both the function and size of a locality. We will consider as rural any locality that exists primarily to service an agricultural hinterland. Urban areas, in contrast, operate economies that are driven by manufacturing, government or some other motor independent of agriculture. Given this view, rural areas can include rural towns of substantial size, perhaps as large as 50,000. Admittedly this definition is difficult to operationalize across a wide number of countries, as it requires intimate knowledge of the regional economies of each. And in most cases, we are prisoners of the rural-urban delineations made by those who have collected the economic data of interest in this review. In order to deal with this problem and also to emphasize the spatial features that are so important to the development of the rural

nonfarm economy, whenever possible we will provide analyses which highlight differences in nonfarm activities across locality size and region.

B. Weight of Non-Agricultural Activities in Africa's Rural Economy

1. Employment

Respecting individual country definitions of "rural", Table 1 indicates that rural nonfarm enterprises provide the primary source of employment for between 3 and 73% of the labor force in rural Sub-Saharan Africa. Although the range is wide, the nonfarm shares of rural employment typically fall in the 10-20% range. As a preliminary indicator, these percentages appear lower than the 20-30% figures reported elsewhere for Asia (Chuta and Liedholm, 1979). But as many observers have noted, figures from both continents should be viewed as minimum estimates, because they frequently exclude rural towns (Anderson and Leiserson, 1980; Chuta and Liedholm, 1979).

The wide range in African rural nonfarm employment shares arises not only from differing definitions of rural or from different rural economic structure, but also because of different perceptions of female workforce participation. Thus Western Nigeria and Benin's shares of nonfarm activity in rural employment attain 73% and 41%, because survey designers in those countries have classified 75% to 85% of active women as working primarily outside of agriculture, for the most part, as we will see later, in commerce. Chad, a Muslim society, represents the opposite extreme. Women appear to participate in little but agriculture. Given the large women's nonfarm earnings measured by female researchers in Muslim Northern Nigeria

TABLE 1
 PRIMARY EMPLOYMENT IN AFRICAN RURAL NONFARM
 ENTERPRISES (RNFE)

Countries	Percent of Rural ^a Labor Force Employed in RNFE		
	Total	Male	Female
Benin (1961)	41	10	77
Cameroon (1976)	10	--	--
Chad (1964)	3	4	.1
Ghana (1960)	27	13	89
Ivory Coast, Bouake Region (1963)	10	--	--
Kenya (1970)	28	--	--
Malawi (1977)	11	17	4
Mali (1976)	8	--	--
Mauritania (1977)	21	--	--
Mozambique (1963)	9	19	1
Nigeria, 3-District W. State (1966)	73	19	87
Rwanda (1978)	5	--	--
Senegal (1970-71)	18	--	--
Sierra Leone (1974, males 1976)	14	19	--
Tanzania (1978)	6	10	2
Togo (1970)	26	--	--
Uganda, 4 Villages (1967)	20	--	--
Zimbabwe (1982)	20	--	--

^aSee Table 16 for details of individual country definitions of rural.

SOURCE: Benin: Republique du Dahomey (1964).
 Cameroon: Republique Unie du Cameroun (19xx).
 Chad: Republique du Tchad (1966).
 Ghana: Ghana (1964).
 Ivory Coast: Republique de Côte d'Ivoire (1965a).
 Kenya: I.L.O. (1972), cited in Chuta and Liedholm (1979).
 Malawi: Malawi Government (1980).
 Mali: Republique du Mali (1980).
 Mauritania: Republique de Mauritanie (1979).
 Mozambique: Republica Popular de Mozambique (1983).
 Nigeria: Mueller and Zevering (1970).
 Rwanda: Republique Rwandaise (1978).
 Senegal: Republique du Senegal (1973).
 Sierra Leone: Male 1976 from Byerlee, et al. (1977); 1974 Aggregate from Thomas (1983).
 Tanzania: United Republic of Tanzania (1982).
 Togo: Republique Togolaise (1974).
 Uganda: Brandt, et al. (1972).
 Zimbabwe: Zimbabwe (1985).

(Simmons, 1976a), it is possible that the very low Chad figure stems not only from different economic participation rates but also, in part, from reporting to enumerators socially accepted perceptions of the appropriate role of women. Thus the role of women matters a great deal in assessing the magnitude of rural nonfarm employment.

As Table 2 shows, seasonal and part-time nonfarm activities employ a further 4 to 20% of the rural male workers and as much as 30% of the total rural labor force. Looking exclusively at agricultural households, farm management surveys in numerous African countries have found 15% to 65% of farmers with secondary employment in nonfarm enterprises. In a similar vein, labor time allocation studies of farm households have found 15% to 40% of total family working hours devoted to income generating nonfarm activities (Cleave, 1974; Anthony et.al., 1979; Norman, 1972; Hill, 1977; Luning, 1967; Okafor, 1983).

2. Income

Income measures the importance of rural nonfarm activities in a way that takes account of both seasonal and part-time nature of much of the activity. As Table 3 shows, between 25% and 30% of African rural income typically comes from nonfarm sources. And because nonfarm activities are monetized to a much larger extent than agricultural production, nonagricultural earnings constitute an even larger share of cash income. Panel B of Table 3 indicates that nonfarm income regularly accounts for 30 to 50% of rural cash incomes.

TABLE 2
 SECONDARY EMPLOYMENT IN AFRICAN RURAL
 NONFARM ENTERPRISES (NFE)

Countries	Percent of Rural Population with Secondary Employment in NFE		
	Total	Males	Females
Benin (1961)	7	--	--
Chad (1964)	--	4	--
Western Nigeria, Three States (1966)	--	20	--
Sierra Leone (1976)	--	11	--
Tanzania (1980)	17	--	--
Zambia, 2 Regions	30	--	--

-- = not available

SOURCE: Benin: Republique du Dahomey (1964).
 Chad: Republique du Tchad (1966).
 W. Nigeria: Mueller and Zevering (1970).
 Sierra Leone: Byerlee, et al. (1977).
 Tanzania: Collier et.al. (1986).
 Zambia: Hedlund and Landahl (1983).

TABLE 3
 SHARE OF NONFARM EARNINGS IN TOTAL RURAL INCOME
 IN SUBSAHARAN AFRICA
 (percent)

Country	Agricultural Income	Nonfarm Income	Total
<u>A. Total Rural Income</u>			
Botswana (1974-75)	56-76	24-44	100
Ghana, Akwapim (1965-66)	58-72	14-28	100
Ghana, Eastern Region (1967-68)	58-82	18-42	100
Ghana, Heads of Household in E. Region	25-50	50-75	100
Ghana, Five Villages	70-84	16-30	100
Ivory Coast, South East Region (1963)	71	29	100
Kenya (1969)	69	31	100
Kenya (1976)	72	28	100
Lesotho (1977-78)	23	77 ^a	100
Northern Nigeria, Kano Region	72	28	100
Northern Nigeria, Zaria Region	78	22	100
Sierra Leone (1974)	64	36	100
Sierra Leone (1975-76)	81	19	100
Tanzania (1969)	79	21	100
Tanzania (1975)	77	23	100
<u>B. Rural Cash Income</u>			
Ghana, Akwapim (1965-66)	55-78	22-45	100
Ghana, Cocoa Farmers (1968-70)	77	23	100
Ghana, Eastern Region (1967-68)	45-68	32-55	100
Ghana, Heads of Household in E. Region	17-45	55-83	100
Ivory Coast, Bouake Region (1970)	58-76	24-42	100
Liberia, Western Region (1973)	69	31	100
Tanzania (1969)	64	36	100
Tanzania (1975)	57	43	100
Zambia, Luapuala Province (1977)	79	21	100
Zambia, Three Provinces (1982)	76	24	100

^aRemittances account for 2/3 of rural income. Domestic nonfarm income is 12 percent of total or 34 percent of domestic rural value added.

Table 3 (CONT.)

- SOURCES: Botswana: Chernichovsky et al. (1985) p. 51.
Ghana, Akwapim: Dutta-Roy & Mabey, Household Budget Survey in Ghana, cited in ILO (1982b) p. 51.
Ghana, Cocoa Farmers: Buxton, Cash Income of Cocoa Farmers in Ghana, cited in ILO (1982b) p. 57.
Ghana, E. Region: Dutta-Roy, Eastern Region Household Budget Survey in Ghana, cited in ILO (1982b) p. 53.
Ghana, Household heads: Ibid. p. 54.
Ghana, Five Villages: Boateng and Wukunya, Weiija Dam Project, cited in ILO (1985d) p. 36.
Ivory Coast: Republique de Côte d'Ivoire (1965a).
Kenya: ILO (1982c).
Lesotho: National Accounts, cited in ILO (1982d) p. 16.
Liberia: Ministry of Planning and Economic Affairs (Liberia), cited in ILO (1982) p. 58.
Nigeria, Kano Region: Matlon (1977); Zaria Region: Norman, Pryor and Gibbs (1979).
Sierra Leone: Chuta and Liedholm (1979).
Sierra Leone: ILO (1981c) p. 278.
Tanzania: ILO (1982a).
Uganda: Massell and Parnes (1969) p. 315.
Zambia, Luapaula: Maimbo (Zambia), cited in ILO (1982q).
Zambia, Three Provinces: Due and Mindenda (1985).

3. Income Distribution

In Asia, distributional considerations appear to magnify the importance of rural nonfarm income. Kilby and Liedholm (1986), in a recent review, show that in Korea, Taiwan, and Thailand, nonfarm income accounts for a larger share of total income for landless households than it does for large landholders. And for a more limited group of countries, the authors find the same J-curve across income, as opposed to land holding, distributions. The J-shaped distributions lead to equity embellished arguments for promoting rural nonfarm activities.

The available Africa data, displayed in Tables 4 through 10, do not show such a clear pattern of equity enhancement from rural nonfarm earnings. They show, in the cases of Northern Nigeria and Lesotho, clearly an opposite trend. Higher income groups derive a greater share of their earnings from nonfarm sources than do the poor. Less detailed evidence from rural Tanzania (Collier, Radwan and Wangwe, 1986) and from farm families in Zambia (Ghai and Radwan, 1984), Uganda (ILO, 1985g) and Zimbabwe (Weinrich, 1970) suggest similarly inequitable trends.

Support for the equity enhancing view of rural nonfarm income comes from rural Botswana and Zaria Region, Northern Nigeria. Displayed in Tables 6 and 7, these data indicate that poor households depend more heavily on nonfarm incomes than do the wealthy, a tendency also identified among farm households in Gambia (ILO, 1985d).

Simmons' synthetic data from Zaria Region, displayed in Table 6, offer tantalizing insights into the distributional importance of women's nonfarm earnings. These data compare income distribution profiles before and after

TABLE 4

RURAL INCOME DISTRIBUTION, KANO STATE,
NORTHERN NIGERIA (THREE VILLAGES)
(in percentages)

<u>Economic Activity</u>	<u>Income Deciles</u>						
	<u>1</u>	<u>2</u>	<u>3-4</u>	<u>5-6</u>	<u>7-8</u>	<u>9</u>	<u>10</u>
<u>Agriculture</u>							
Own Farm	80	75	77	77	75	60	63
Wages	8	4	4	5	1	4	10
Total Agriculture	88	79	81	82	74	64	64
<u>Nonagriculture</u>							
Nonagricultural Income	12	21	19	18	26	36	36
Grand Total	100	100	100	100	100	100	100

SOURCE: Malton, Income Distribution among Farmers in N. Nigeria,
p. 44.

TABLE 5

LESOTHO, RURAL INCOME DISTRIBUTION,
THABA TSEKA-PHUTHIATSANA PROJECT,
1975/76
(in percentages)

<u>Economic Activity</u>	<u>Income Categories</u>			
	<u>0 - 200</u>	<u>200 - 600</u>	<u>600 - 1,000</u>	<u>1,000+</u>
<u>Agriculture</u>				
Crops	39	16	3	4
Livestock	30	21	6	12
Total Agriculture	69	37	9	16
<u>Nonagricultural</u>				
Remittances	8	53	81	71
Nonfarm	23	10	9	13
Total Nonagricultural	31	63	90	84
Grand Total	100	100	100	100

SOURCE: Van Der Wiel, cited in ILO (1982) p. 46.

TABLE 6

THE EFFECT OF WOMEN'S NONFARM EARNINGS ON HYPOTHESIZED^a
RURAL INCOME DISTRIBUTION, ZARIA REGION,
NORTHERN NIGERIA, 1970/71
(percent)

	<u>Dan Mahawayi Village</u>			<u>Hanwa Village</u>		
	<u>Low Income</u>	<u>Middle Income</u>	<u>High Income</u>	<u>Low Income</u>	<u>Middle Income</u>	<u>High Income</u>
<u>A. Income, Excluding Women's Off-farm Earnings</u>						
<u>Farm Income</u>	74	83	76	89	84	68
<u>Off-farm Income</u>						
Male adults	26	27	23	11	16	32
Total Without Estimated Women's Earnings	100	100	100	100	100	100
<u>B. Income, Including Estimated Women's Off-farm Earnings</u>						
<u>Farm Income</u>	50	66	64	42	49	56
<u>Off-farm Income</u>						
Male adults	17	19	20	5	9	26
Female adults	33	16	16	52	42	19
Total off-farm	50	34	36	57	51	44
Total "Household" Income	100	100	100	100	100	100

^aOriginal household survey data did not include female off-farm earnings because of difficulties in obtaining such data. Women's nonfarm earnings were estimated in a later separate survey effort and the two data sets consolidated to produce hypothesized total "household" incomes.

SOURCE: Norman, Simmons and Hays (1982).

TABLE 7

BOTSWANA
RURAL INCOME DISTRIBUTION, 1974/75
(percent of rural income)

<u>Economic Activity</u>	<u>Income Categories</u>			
	<u>0.5 - 10 Percent</u>	<u>15 - 50 Percent</u>	<u>60 - 95 Percent</u>	<u>97 - 99.7 Percent</u>
<u>Agriculture</u>				
Crops	6	9	4	0
Livestock	5	7	32	64
Gathering & Hunting	18	8	2	2
Total Agriculture	<u>29</u>	<u>24</u>	<u>38</u>	<u>66</u>
<u>Nonagricultural</u>				
Manufacturing	5	8	1	0
Services	3	1	1	1
Trade	0	2	2	22
H. Benefits	10	7	3	2
Transfers	21	14	4	0
Property Income	0	0	10	0
Additional Income	17	10	7	6
Taxes	0	-2	-2	-7
Total Nonagricultural	<u>55</u>	<u>40</u>	<u>26</u>	<u>24</u>
<u>Not Classified</u>				
Wage Employment	<u>15</u>	<u>36</u>	<u>36</u>	<u>9</u>
Grand Total	100	100	100	100

SOURCE: Botswana (1976). "The Rural Income Distribution Survey in Botswana 1974-75," Central Statistics Office.

TABLE 8

SIERRA LEONE
RURAL INCOME DISTRIBUTION, 1975
(percent of rural income)

	<u>Income Terciles</u>		
	<u>Low</u>	<u>Middle</u>	<u>High</u>
<u>Agricultural Income</u>			
Annual Crops	58	63	61
Tree Crops	22	18	19
Livestock	<u>.4</u>	<u>.2</u>	<u>.1</u>
Total Agriculture	80	81	80
<u>Nonagricultural Income</u>			
Small Scale Industry	5	4	7
Hunting, gathering, fishing	2	8	9
Trading ^a	<u>2</u>	<u>1</u>	<u>1</u>
Total Nonagriculture	9	13	17
<u>Not Classified</u>			
Hired Labor	11	6	3
<u>Grand Total</u>	100	100	100

^aSurvey excludes households whose primary source of income is trading.

SOURCE: Matlon et.al. (1979).

TABLE 9

KENYA, RURAL INCOME DISTRIBUTION, 1974-75
(in percentages)

Income Sources	Income (in shillings)						
	0 - 9,000	1,000 - 1,999	2,000 - 2,999	3,000 - 3,999	4,000 - 5,999	6,000 - 7,999	8,000 and Over
Farm Operating Surplus	23	44	53	56	61	61	64
Nonfarm Operating Surplus	16	11	10	12	12	6	11
Remittances from Relatives	29	18	16	11	9	6	3
Other Gifts	3	3	2	1	3	2	1
Total nonfarm	48	32	28	24	24	14	15
Regular Employment	8	10	5	13	9	19	19
Casual Employment	21	15	14	6	6	6	2
Total unclassified	29	25	19	19	15	25	21
Total	100	100	100	100	100	100	100

SOURCE: Kenya, Statistical Abstract (1976) p. 139.

TABLE 10

FREQUENCY OF NONFARM ACTIVITY BY HUMAN RESOURCE LEVEL, ZAMBIA, 1976:
PERCENT OF HOUSEHOLDS EARNING SOME INCOME FROM EACH ACTIVITY

Activity	Households Groups, Classified by Resource Level				All
	1 Disadvantaged	2 Subsistence	3 Slightly Above Average	4 Above Average	
Brewing	33	37	32	17	33
Fishing	25	21	7	5	19
Charcoal Burning	4	5	1	--	4
Woodcarving	5	12	5	3	7
Brickmaking	4	12	16	8	9
Trading	5	5	7	17	6
Store Owner	--	--	3	14	2
Wage Employment	<u>8</u>	<u>6</u>	<u>24</u>	<u>17</u>	<u>10</u>
Total	84	98	95	81	90

SOURCE: Marter and Honeybone (1976), p.43.

estimated corrections for missing female nonfarm earnings, originally omitted because of the difficulty of obtaining responses to questions about women's earnings in that Muslim region. The resulting income profiles suggest that women's nonfarm earnings are not only substantial but also most important among low income households. It is the women's earnings that turn the nonfarm contributions to household income larger in low than in high income families. In addition to highlighting the distributional importance of women's nonfarm earnings in Northern Nigeria, this simulated finding casts doubt on the direction of the Kano Region rural nonfarm income profiles in Table 4, since those include only male nonfarm earnings (Matlon, 1977).

The Kenya and Sierra Leone data, presented in Tables 8 and 9, do not permit a definitive judgement about the income distribution effects of rural nonfarm income, primarily because they lump together all "wage income," combining both agricultural and non-agricultural wage earnings. But they, along with the Zambia data in Table 10 and the Botswana evidence in Table 7, do highlight important income distribution differences both among sources of nonfarm income and across regions. In the Southern African countries of Zambia and Botswana, income from trading and commerce accrues largely to wealthy rural households. That finding is consistent with popular images of wealthy general store owners in those countries. The apparently opposite result in Sierra Leone stems from the omission of predominantly trading households from the rural sample selection in that study (Matlon et.al., 1979).

Manufacturing income, in both rural Botswana and rural Zambia, does work in favor of income equality, providing a larger share of income for poor than rich. In both countries, female dominated food processing - about 80% of it sorghum and maize beer brewing - accounts for the bulk of this manufacturing income (Botswana, 1976; Milimo and Fisseha, 1986). But in Sierra Leone, where indigenous beer is not brewed, manufacturing income accrues primarily to the wealthy. Once again, female dominated activities swing the distributional balance.

While blanket equity arguments supporting promotion of rural nonfarm activities cannot be imported from Asia to Africa, some activities - frequently female dominated food preparation - do appear to enhance income equality. And even if the impact on relative inequality is uncertain or negative, in terms of absolute poverty alleviation nonfarm earnings cannot but help improve the economic status of the poor.

C. Characteristics of Rural Non-Farm Enterprises (RNFE)

1. Size distribution

The overwhelming majority of rural nonfarm enterprises are extremely small. In fact, studies of manufacturing - the most closely studied segment of the nonfarm economy - uniformly find the great majority of total rural and urban employment in firms employing less than 10 workers. Table 11 indicates that firms with less than 10 workers employ between 60 and 95% of the entire manufacturing labor force in the half dozen countries for which evidence is available.

TABLE 11
 DISTRIBUTION OF EMPLOYMENT IN AFRICAN
 MANUFACTURING, BY FIRM SIZE
 (percent)

<u>Country and Date</u>	<u>Firm Size (number of workers)</u>		
	<u>Large Scale</u>	<u>Small Scale</u>	
	<u>50 or More Engaged</u>	<u>10-49 Engaged</u>	<u>Below 10 Engaged</u>
Ghana (1970)	15	1	84 ^a
Kenya (1969)	41	10	49 ^a
Nigeria (1972)	15	26	59 ^a
Sierra Leone (1974)	5	5	90
Tanzania (1967)	37	7	56 ^a
Zambia-1985	16	1	83

^a Computed as a residual, the difference between employment recorded in labor force or population surveys and establishment surveys.

SOURCE: Chuta and Liedholm (1979); Page (1979); Milimo and Fisseha (1985).

And rural firms are so small many analysts refer to them as "micro-enterprises." As Table 12 shows, average employment in rural nonfarm enterprises regularly averages less than two, the owner plus one additional worker. In countries such as Burkina Faso, Ghana, Nigeria, Sierra Leone and Zambia, one-person enterprises constitute about half of all nonfarm enterprises; and well over 95% employ five people or less.

Although differences are not large, the limited available evidence - from Ghana, Sierra Leone, and Zambia - does suggest that manufacturing enterprises tend to be slightly larger than other nonfarm activities. Trading establishments follow, with service establishments being the smallest (Thomi and Yankton, 1985; Liedholm and Chuta, 1976; Milimo and Fisseha, 1986).

Large scale firms establishing operations in rural areas are frequently limited to major trading establishments - either large distributors or wholesalers of major agricultural commodities - and large resource-based manufacturers. Large rural manufacturers generally confine their operations to weight losing production processes - such as lumbering, sugar production and oil extraction - or the preliminary processing of perishable commodities such as tea, cocoa and coffee. Studies in Ghana (Andrae, 1981), Kenya (Freeman and Norcliffe, 1985), and Zaire (Congo, 1968) clearly point to the concentration of large-scale rural manufacturing in lumbering, mining, and food processing.

In West and Central Africa, rural nonfarm establishments employ primarily family laborers and apprentices. As Table 13 indicates, hired workers from outside the family comprise less than 20% of nonfarm

TABLE 12
 SIZE DISTRIBUTION OF AFRICAN RURAL
 NONFARM ENTERPRISES
 (percent of firms)

	Average Employment Per Enterprise	Firm Size, by Employment		
		1 ^a	2-5	6+
Burkina Faso, Eastern Province (1978)	1.8	56	--	--
Ghana, Rural Towns (1984)	n.a.	46	37	17
Kenya, Central Province (1983)	1.8	--	--	--
Kenya, Meru District (1978) ^b	2.8	36	43	10
Kenya, Bangowa District (1978) ^b	3.0	22	69	9
Sierra Leone (1974) ^c	1.6	42	53	5
Zambia, Six Rural ^c Provinces (1984)	1.6	68	30	1

^aIncludes owner operator.

^bInformal sector only, but including establishments such as sawmills employing 20 people on average.

^cIncludes only manufacturing and repair enterprises employing less than 50 workers.

SOURCES: Burkina: Wilcock and Chuta (1982).
 Ghana: Yankson (1985).
 Kenya, Central Province: Freeman and Norcliffe (1985).
 Kenya, Meru and Bangowa Districts: Williams and McClintock (1981).
 Sierra Leone: Liedholm and Chuta (1976).
 Zambia: Milimo and Fisseha (1985).

TABLE 13

COMPOSITION OF WORKFORCE
EMPLOYED IN AFRICAN RURAL NONFARM ENTERPRISES
(percent of rural nonfarm employment)

	Owner Plus Family Workers	Apprentices	Hired Workers	Coops and Others	Total
Burkina Faso, Eastern Region (1980)	95	3	2	0	100
Kenya, Meru District (1978)	30	3	63	0	100
Kenya, Bangowa District (1978)	46	3	53	0	100
Malawi (1977)	34	0	66	0	100
Mozambique (1980)	20	--	75	5	100
Nigeria, Western Region (1970)	39	50	11	0	100
Mid-West Region (1971)	30	63	7	0	100
Rwanda (1978)	29	10	69	0	100
Tanzania (1978)	11	0	84	0	100
Zambia (1985)	92	5	3	0	100

SOURCE: Burkina: Wilcock and Chuta (1981).
Kenya: Williams and McClintock (1981).
Malawi: Republique du Mali (1980).
Mozambique: Republica da Mozambique (1983).
Nigeria: Aluko (1972) and (1973).
Rwanda: Republique Rwandaise (1978).
Tanzania: Tanzania (1982).
Zambia: Milimo and Fisseha (1986).

employment on average in these regions. But in East and Southern Africa, with their settler economies and a long history of wage labor on plantations and in mines, the percentage of nonfarm wage labor appears much higher, in the region of 60% of rural nonfarm employment. Unfortunately, the Malawi, Mozambique and Tanzania censuses did not specifically include apprentices as a job category in their classification scheme, so their hired labor category may include apprentices as well. Consequently, it is not possible to determine whether their categorization reflects a real absence of apprenticeship or simply a lapse in survey design. Either census definitions do not provide sufficient job category discrimination in Southern Africa or history has left a legacy of differential employment structures across the continent.

2. Capital Requirements

Not only are rural nonfarm enterprises small in terms of employment per enterprise, they require modest amounts of capital as well. As Table 14 shows, average capital per enterprise commonly ranges between \$500 and \$4,000 in African rural nonfarm activities. But requirements vary considerably among activities. High capital activities such as grain milling, sawmills, wholesaling, gasoline stations, photography and pharmacies demand on the order of \$1,000 to \$10,000 per enterprise; while pottery, leatherwork, weaving, small scale trading, personal services and repairs require in the range of \$50 to \$600.

Because capital includes not only the cost of equipment but also buildings, and working capital, investment costs depend heavily on the nature of the business premises and whether they are owned or rented.

TABLE 14
 CAPITAL INVESTMENT IN AFRICAN RURAL NONFARM ENTERPRISES
 (1980 \$U.S. per enterprise)

	<u>Botswana</u>	<u>Burkina,^a Eastern Province</u>	<u>Kenya Central Province</u>	<u>Rural Sierra Leone</u>
<u>Manufacturing</u>				
Tailoring	\$ 566	\$ 191	\$ 1,528	\$ 571
Beer Brewing	110	--	9,785 ^b	--
Milling	2,460	3,378	7,376	--
Carpentry	126	429	5,878	676
Baking	7,500	88	--	1,527
Blacksmith	--	69	--	909
Metal Working	--	204	1,489	--
<u>Commerce</u>				
Gas Stations	--	5,000	6,132	--
Wholesaling	--	--	13,689	--
Pharmacies	--	1,514	--	--
Bars	--	584	4,246 ^c	--
General Retailers	--	521	4,212	--
<u>Services</u>				
Restaurants	--	49	--	--
Photography	--	983	--	--
Barbers	--	210	515	--
Bicycle Repair	--	--	1,552	--

^aStart-up capital. All others capital at time of interview.

^bAverage employment is eight per enterprise as opposed to one to two in Botswana. Probably includes building.

^cIncluded restaurants as well.

SOURCE: Botswana: Haggblade (1982).
 Burkina: Wilcock and Chuta (1981).
 Kenya: Freeman and Norcliffe (1985).
 Sierra Leone: Liedholm and Chuta (1976).

Buildings, for example, account for about 80% of the investment costs in Botswana and Sierra Leonean bakeries. For this reason, and because it is more comfortable in hot climates, many rural entrepreneurs prefer to work outdoors, under trees or simple lean-tos. Displaying data for a range of nonfarm activities in Sierra Leone, Table 15 decomposes total rural enterprise investment costs into their three constituent elements. In addition to giving a feel for the relative magnitudes of each component of investment costs, the table illustrates the tendency of businesses in larger towns to operate from more sophisticated premises than their counterparts in small rural localities.

3. Seasonality

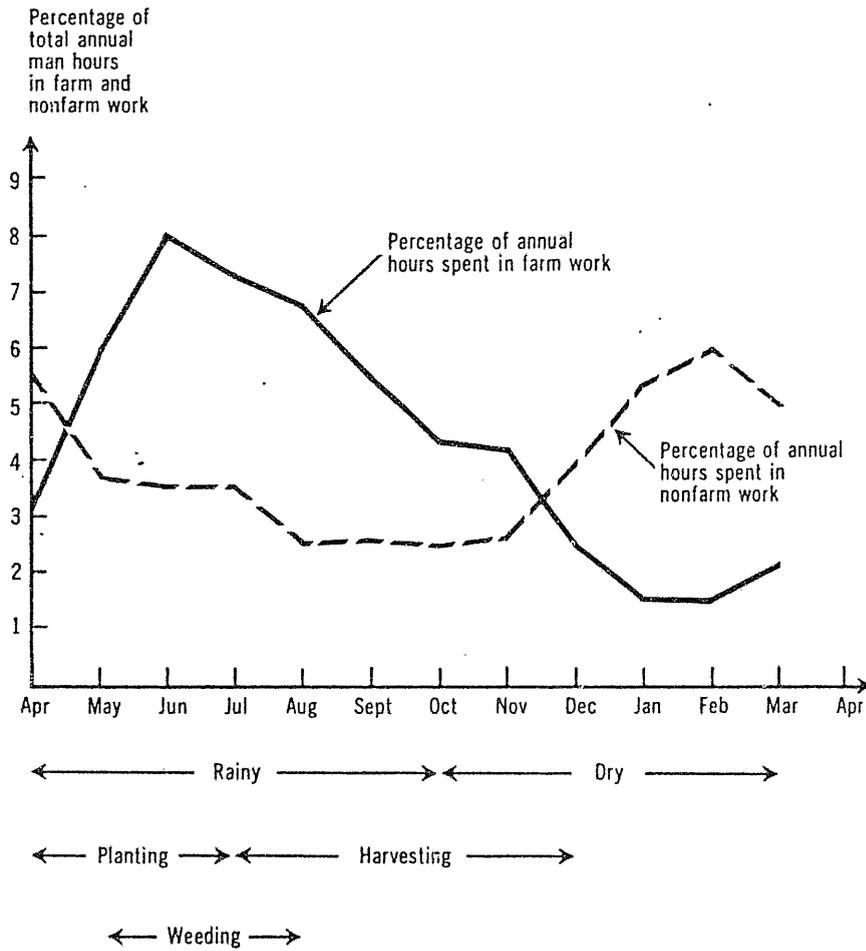
Rural nonfarm enterprises experience marked seasonal fluctuations in activity. As Figure 1 shows, levels of rural nonfarm activity generally run countercyclically to the agricultural calendar. Nonfarm enterprises typically achieve peak activity in the dry season immediately after harvest when both labor inputs and cash demand for nonfarm products are most freely available in the rural economy. While Figure 1 depicts nonfarm labor profiles in Nigeria, similar seasonal profiles have been observed in Burkina (Delgado, 1979), Ivory Coast (Cote d'Ivoire, 1965a and 1967a), Ghana (Yankton, 1985), Gambia (ILO, 1985c), Botswana (Chernicovsky et.al. 1985), Sierra Leone (Liedholm and Chuta, 1976) and in other parts of Nigeria (Mueller and Zvering, 1969). Despite the marked seasonality, numerous time allocation studies have found that nonfarm troughs rarely descend to zero. Even during the peak agricultural season, nonfarm activities can occupy as much as three to four hours a day (Eicher and

TABLE 15
 COMPOSITION OF CAPITAL STOCK IN SIERRA LEONEAN
 SMALL INDUSTRY, 1974/75
 (Leones)

Industrial Category	Components of Capital	Locality Size			
		Less Than 2,000	2,000- 20,000	20,000- 100,000	Over 100,000
Tailors	Building	57	102	288	911
	Equipment	128	165	244	469
	Working capital	0	16	36	26
	Total capital input	185	283	568	1,406
Carpentry	Building	57	488	292	---
	Equipment	118	261	91	---
	Working capital	0	100	221	---
	Total capital input	175	849	604	---
Blacksmiths	Building	57	351	1,785	1,171
	Equipment	123	426	816	1,277
	Working capital	0	62	6	108
	Total capital input	180	839	2,607	2,556
Baking	Building	---	---	409	---
	Equipment	---	---	72	---
	Working capital	---	---	75	---
	Total capital input	---	---	556	---

SOURCE: Liedholm and Chuta (1976).

FIGURE 1
 SEASONAL PATTERNS OF LABOR USE IN FARM AND NONFARM ACTIVITIES,
 DAN MAHAWAYI, NORTHERN NIGERIA 1966-67



Source: Norman (1973) as rendered by World Bank (1978a).

Baker, 1982; Cleave, 1974; Norman, 1974; Matlon et.al. 1982).

While in the aggregate nonfarm activity fills in the troughs in the agricultural calendar, a disaggregated view of the nonfarm economy reveals several exceptions to that general tendency. Evidence from Sierra Leone, for example, indicates that rural blacksmithing activity reaches its peak during the height of the agricultural season, as farmers require new tools and repair services for farm equipment. Baking also reaches its peak at this time, probably because its closest substitute, rice, is least available prior to harvest (Liedholm and Chuta, 1976).

4. Composition

Aggregate employment data for rural Africa remain in short supply, because most studies have focused on limited portions of the rural economy. Many have concentrated exclusively on farm households; while others, interested in the nonfarm economy, commonly enumerate manufacturing and repair services, rarely including other services or commercial establishments.

Nonetheless, some available data do allow a comprehensive view of the rural economy. Coming mainly from population censuses, they are presented in Table 16. Amid wide variation, these data indicate that commercial establishments typically predominate, employing 30 to 40% of the rural nonfarm workforce. Services and manufacturing comprise about 25% each, with construction and mining accounting for the remainder.

Because manufacturing has frequently been singled out for special investigation, it is possible to provide a more detailed decomposition of that one quarter of the rural nonfarm economy. The breakdowns in Table 17

TABLE 16

MAGNITUDE AND COMPOSITION OF AFRICAN RURAL^a NONFARM EMPLOYMENT^bA. Employment Percentages

<u>Countries</u>	1 AGRIC. (% of total emp.)	2 NON-AGRI	2a Mining	2b Mfr.	2c Constr.	2d Commerce*	2e Service	2f Other	3 TOTAL
AFRICA									
Benin, 1961	58.6	41.4	0.0	17.2	1.2	78.2	3.3	0.0	100.0
Cameroon, 1976	89.6	10.4	0.2	23.8	8.6	16.1	31.4	19.9	100.0
Chad, 1964	96.9	3.1	0.0	12.7	8.1	20.8	58.4	0.0	100.0
Ghana, 1960	73.2	26.8	5.7	28.8	9.1	44.4	12.0	0.0	100.0
Ivory Coast, Bouake Region, 1963	90.0	10.0	0.0	34.1	0.0	50.7	15.2	0.0	100.0
Malawi, 1977	89.0	11.0	0.8	24.9	14.9	23.5	19.4	16.4	100.0
Mali, 1976	91.7	8.3	0.8	39.8	0.8	9.0	14.9	34.7	100.0
Mauritania, 1977	79.2	20.8	1.9	17.3	5.8	34.1	40.9	0.0	100.0
Mozambique, 1980	91.0	9.0	0.0	50.9	5.6	17.6	25.9	0.0	100.0
Rwanda, 1978	95.1	4.9	9.5	23.4	13.2	11.0	40.2	2.7	100.0
Senegal, 1970/71	82.3	17.7	2.4	34.3	4.3	38.3	20.5	0.2	100.0
Sierra Leone, 1974	86.2	13.8	5.4	20.3	7.9	44.9	21.4	0.0	100.0
Tanzania, 1978	93.9	6.1	0.0	19.6	0.0	9.6	23.1	47.7	100.0
Togo, 1970	74.5	25.5	0.1	18.6	4.2	26.7	7.9	42.4	100.0
Zimbabwe, 1982	80.0	20.0	0.0	46.6	0.0	8.1	27.4	17.9	100.0
ASIA									
India, N. Arcot Region, 1981	75.0	25.0							100.0
Philippines, Neuva Ecija Prov., 1971	52.0	48.0							100.0
Thailand, 1975/76	83.0	17.0							100.0

Table 16 (CONT.), Page 2

B. Employment Densities
(employment per 1000 population)

<u>Countries</u>	<u>1</u> <u>AGRIC.</u>	<u>2</u> <u>NON-AGRI</u>	<u>2a</u> <u>Mining</u>	<u>2b</u> <u>Mfr.</u>	<u>2c</u> <u>Constr.</u>	<u>2d</u> <u>Commerce*</u>	<u>2e</u> <u>Service</u>	<u>2f</u> <u>Other</u>	<u>3</u> <u>Grand Total</u>
AFRICA									
Benin, 1961	265.6	188.0	0.0	32.4	2.2	147.1	6.3	0.0	453.7
Cameroon, 1976	359.3	41.7	0.1	9.9	3.6	6.7	13.1	8.3	401.1
Chad, 1964	302.1	9.5	0.0	1.2	0.8	2.0	5.6	0.0	311.6
Ghana, 1960	277.8	101.8	5.8	29.4	9.3	45.2	12.2	0.0	379.7
Ivory Coast, Bouake Region, 1963	424.4	47.0	0.0	16.0	0.0	23.8	7.1	0.0	471.4
Malawi, 1977	374.0	46.3	0.4	11.5	6.9	10.9	9.0	7.6	420.3
Mali, 1976	333.9	30.3	0.3	12.1	0.2	2.7	4.5	10.5	364.1
Mauritania, 1977	249.6	65.6	1.3	11.3	3.8	22.4	26.8	0.0	315.2
Mozambique, 1980	450.6	44.5	0.0	22.6	2.5	7.8	11.5	0.0	495.1
Rwanda, 1978	544.0	27.8	2.6	6.5	3.7	3.1	11.2	0.8	571.8
Senegal, 1970/71	121.3	26.1	0.6	9.0	1.1	10.0	5.4	0.1	147.4
Sierra Leone, 1974	530.4	85.0	4.6	17.3	6.7	38.2	18.2	0.0	615.4
Tanzania, 1978	425.6	27.6	0.0	5.4	0.0	2.7	6.4	13.2	453.2
Togo, 1970	268.5	91.9	0.1	17.1	3.9	24.5	7.3	38.9	360.3
Zimbabwe, 1982	233.0	58.2	0.0	27.1	0.0	4.7	15.9	10.4	291.1
ASIA									
India, N. Arcot Region, 1981	253.0	83.0							336.0
Philippines, Nueva Ecija Prov., 1971	132.0	120.0							750.0
Thailand, 1975/76	625.0	125.0							252.0

^aRural as defined in each population census. Normally localities with less than about 5000 persons. See attached notes for specific country definitions.

^bEmployment is defined as economically active population primarily engaged in each activity. Seasonal employment. See attached notes for labor force definitions.

*Includes Transport. .

SOURCES: Benin: Republique du Dahomey (1964).
Cameroon: Republique du Cameroun (1980).
Chad: Republique du Tchad (1966).
Ghana: Ghana (1964).
Ivory Coast: Republique de Cote d'Ivoire (1964).
Malawi: Malawi Government (1980).
Mali: Republique du Mali (1980).
Mauritania: Republique Islamique de Mauritanie (1979).
Mozambique: Republica Popular de Mocambique (1983).
Rwanda: Republique Rwandaise (1978).
Senegal: Republique du Senegal (1973).
Sierra Leone: Thomas (1983).
Tanzania: United Republic of Tanzania (1982).
Togo: Republique Togolaise (1974).
Zimbabwe: Zimbabwe (1985).

TABLE 16

NOTES AND REFERENCES

SOURCES: Benin: Republique du Dahomey (1964).
 Cameroon: Republique du Cameroun (1980).
 Chad: Republique du Tchad (1966).
 Ghana: Ghana (1964).
 Ivory Coast: Republique de Cote d'Ivoire (1964).
 Malawi: Malawi Government (1980).
 Mali: Republique du Mali (1980).
 Mauritania: Republique Islamique de Mauritanie (1979).
 Mozambique: Republica Popular de Mocambique (1983).
 Rwanda: Republique Rwandaise (1978).
 Senegal: Republique du Senegal (1973).
 Sierra Leone: Thomas (1983).
 Tanzania: United Republic of Tanzania (1982).
 Togo: Republique Togolaise (1974).
 Zimbabwe: Zimbabwe (1985).

NOTES:

Benin: Rural = not explicitly defined. Implicitly includes population in localities of less than 9500 persons. Economically active = all people over 15 years of age. Women's participation rate = 73% vs. 95% for men.

Cameroon: Rural = all areas outside of provincial, departmental, arrondissement and district headquarters and outside selected settlements over 5,000 with highschools, hospitals or train stations. Economically active = population six and over. Women's participation = 38% vs. 62% for men.

Chad: Rural = all population living outside of prefecture headquarters or in localities of less than 5000 in the South and less than 3000 in the North. Economically active = all people over 15 years of age. Women's participation rate = 28% vs. 94% for men.

Ghana: Rural = localities under 5,000 according to official definition. But economic activity breakdown only available for towns under 10,000. Data in table refer to towns under 10,000 as rural. Economically active = all people over 15 years of age. Women's participation rate = not given explicitly but is evidently 33% lower than men's.

Ivory Coast, Bouake Region: Rural = entire Bouake region including rural towns. Economically active = population aged 15-59. Women's participation rate = not specified.

Malawi: Rural = undefined. Rural towns taken as all urban areas outside of Lilongwe, Blantyre and Zomba. Economically active = all persons over 10 years of age. Women's participation rate = 44% vs. 52% for men.

Table 16 (CONT.)

- Mali: Rural = areas outside of legally designated "communes". Implicitly settlements over about 3,000. Economically active = not defined. Women's participation rate = not given.
- Mauritania: Rural = not defined. Taken as all regions except 3 with over 85% population designated as urban. Essentially all localities under 10,000. Economically active = all persons over 12 years of age. Women's participation rate = 25% vs. 82% for men.
- Mozambique: Rural = all areas outside 12 major cities. Twelve city sizes not cited. Economically active = all persons over 12 years of age. Women's participation rate = 81% vs. 78% for men.
- Rwanda: Rural = areas outside prefecture headquarters and two other localities designated as urban. Economically active = all persons over 7 years of age. Women's participation rate = not given.
- Senegal: Rural = localities less than 1000. Economically active = all persons over 6 years of age. Women's participation rate = 23% vs. 60% for men.
- Sierra Leone: Rural = census definition, all towns under 5000. Since employment not broken down by town, rural defined here as all districts with at least 75% of their population in localities of under 2000. Economically active = all persons over 12 years of age. Women's participation rate = equal to that of men. Each accounts for 50% of the labor force.
- Tanzania: Rural = regional and district headquarters plus towns over 5000. Economically active = all persons over 5 years of age. Women's participation rate = 55% vs. 54% for men.
- Togo: Rural = all areas outside of Lome and 6 legally designated "communes". Economically active = population over 12 years of age. Women's participation rate = not given.
- Zimbabwe: Rural = population living in towns under 2,500. During 1969 census urban = any locality over 150 if majority of males employed in non-agricultural occupations. Economically active = population over 15. Women's participation rate = 48% vs. 80% for men.

TABLE 17
ACTIVITY BREAKDOWN OF RURAL MANUFACTURING EMPLOYMENT
(in percents)

Item	Burkina ^a 1980	Zambia ^b 1986	Kenya ^c 1977	Nigeria ^d 1972/73	Sierra Leone ^e 1976
Food/Agricultural Processing	55	55	22	2	5 ^f
Clothing Products	25	6	22	56	53
Wood Products	1	32	43	11	19
Metal Products	8	4	6	4	19
Other	21	3	7	27	4

^aEastern ORD, 1980.

^bSix Rural Provinces, 1986.

^cCentral Province Village Centers, 1977.

^dFour States, 1972/73.

^eAll Rural, 1976.

^fIncludes only bakeries.

SOURCE: Burkina Faso: Chuta and Wilcox (1982); firms below 50 persons.
Kenya: Norcliffe, Freeman, and Miles (1984); firms below 50 persons.
Nigeria: Aluko et al. (1972 and 1973); firms below 50 persons; enterprise, not employment percentages.
Sierra Leone: Liedholm and Chuta (1976); firms below 50 persons.
Zambia: Milimo and Fisseha (1985).

indicate that, within manufacturing, food preparation, tailoring, carpentry and metal working activities predominate. The importance of food preparation - particularly beer brewing, small restaurants and prepared foods - varies enormously across studies, in part due to differences in activity coverage and failure of some studies to interview within households.

Differences in survey coverage complicate cross country comparisons not only in manufacturing but even more so for the remainder of the rural nonfarm economy. They make it difficult to meaningfully compare employment percentages across surveys, because activity shares are computed as percentages of different bases depending on the comprehensiveness of the survey coverage. One solution to this problem is to compute employment densities per 1,000 members of population. Because it measures all surveyed activities against a common yardstick, this procedure allows comparison of relative activity intensities for all activities enumerated, even if a survey's activity coverage is only partial. This approach is taken throughout much of this paper, especially in Section III.A. where we explore features of structural transformation using cross section data.

Using this approach, the nonfarm employment densities in Table 16 provide tantalizing initial insights into differences in the Asian and African rural nonfarm sectors. The data, in Panel B, suggest that Asian rural nonfarm employment densities lie in the range of 80 to 120 per 1,000 population, while the Africa densities only in West Africa reach this level. Elsewhere they are much lower, more frequently on the order of 40 to 50 per 1,000. Thus, initially, it appears that the Asian rural economy

supports about double the nonfarm activity found in East, Central and Southern Africa.

5. Gender

Across much of Africa, women participate actively RNFE. Yet social and religious norms vary considerably from country to country and in some cases tightly shape the economic options available to women. This is clearly the case in Muslim countries, as the Chad data in Table 1 indicate. And even in non-Muslim countries, convention frequently dictates that women participate in activities that can be done in the home, with low capital requirements, and with skills they already have. This leads to their predominance in food preparation, restaurants, basket making, and in some regions, ceramics, weaving and tailoring. Of course across West Africa, and in many other regions as well, women also play a major role in retailing and trade. As Table 18 indicates, women account for a substantial proportion of both employment and management in rural enterprises, between 50 and 60% in Zambia and Ghana.

Because of differential access to education and because the obligations of child rearing combine with social expectations, this is far higher than female participation rates in formal sector employment. For Ghana and Kenya, the two countries in Table 18 for which it is possible to directly compare, women's share of formal sector employment reaches only 10% and 14% respectively compared to 54% and 25% shares in informal, small enterprises. (Steel, 1977; ILO, 1972). So opportunities in small private businesses afford African women a major economic outlet. An important question to be examined below is how projected changes in the African rural economy will affect these predominantly female nonfarm occupations.

TABLE 18

FEMALE PARTICIPATION IN RURAL NONFARM ENTERPRISES IN
 SUBSAHARAN AFRICA: FEMALE PARTICIPATION
 AS PERCENT OF TOTAL

	Zambia ^a		Kenya ^b	Ghana ^c
	<u>Owners</u>	<u>Employed</u>	<u>Employed</u>	<u>Employed</u>
<u>Manufacturing</u>				
Traditional beer	99	91	--	--
Ceramics	92	85	--	--
Garments	75	73	26 ^d	65
Foods	69	52	15 ^f	86
Carpentry	12 ^e	12 ^e	4 ^f	21
Metals	6	4	4 ^f	1
<u>Commerce</u>				
Vending/Retailing	59	60	38	--
Trading	31	24	--	--
<u>Services</u>				
Restaurants	37	47	18	--
Bars	12	17	--	--
Total	60	54	25	54

^aRural, Six Provinces, 1985.

^bCentral Province Market Centers, 1977.

^cTotal National Manufacturing, 1970.

^dIncludes primary extraction.

^eAll forest based production, charcoal production plus carpentry.

^fIncludes metals and carpentry together.

SOURCE: Zambia: Milimo and Fisseha (1985) (Includes only enterprises employing 50 or less.); Kenya: Norcliffe and Freeman (1979); Ghana: Steel (1977).

III. STRUCTURAL TRANSFORMATION OF THE RURAL NONFARM ECONOMY

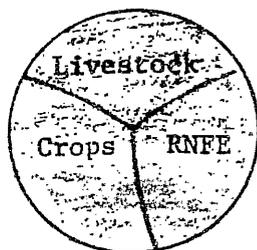
A. Empirical Profile of the Structural Transformation

1. Megatrends

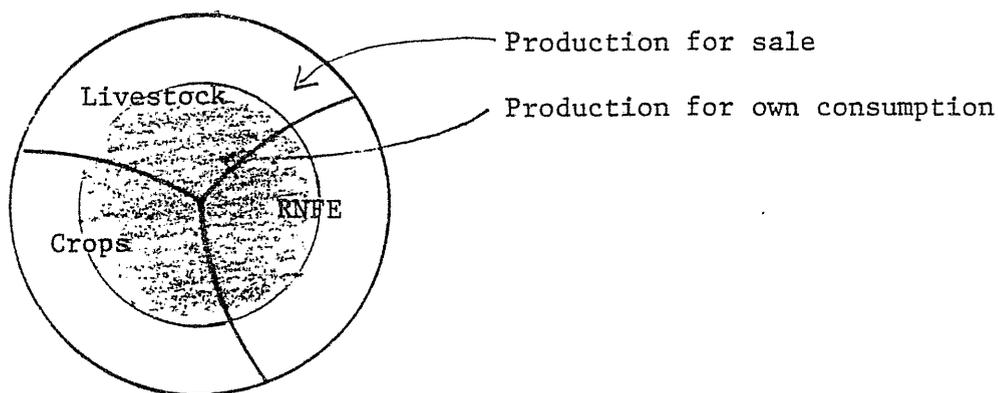
In evaluating the present structure of Africa's rural nonfarm enterprises as well as the potential for farm-nonfarm growth linkages, it is useful to first step back and review the grand lines of the economic transformation that has been taking place there over long stretches of time. Figure 2 describes that general evolution over a time horizon of many centuries. It begins long ago, with a countryside populated by self-sufficient, primarily agricultural households which provide for all their own needs. There are no market exchanges, but within each household family members engage in both farm and nonfarm activities. By fiat, the head of household allocates labor and capital among activities.

Specialization, a central feature of economic growth, emerges very early on in response to technical change, opportunities for trade with outside regions, introduction of new crops, population growth and a host of other factors. Diversification out of agriculture is a key feature of this specialization. In the absence of secure importable food supplies, specialization requires, as a precondition, increased agricultural productivity per worker in order to avoid community starvation. As population grows and opportunities arise, households begin to concentrate on some activities, beyond their own consumption needs, based on locational advantages, historical access to key inputs or technology, or the proclivity and talents of individual members. Households begin commodity

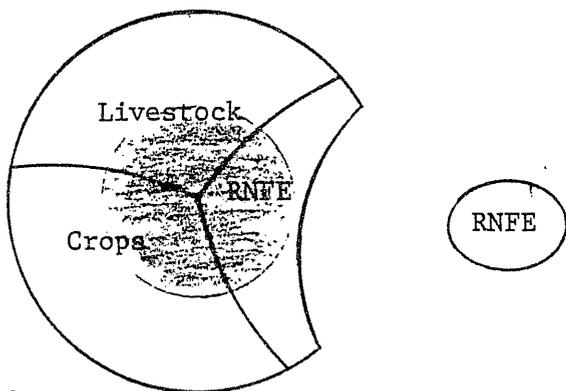
Evolution of Rural Nonfarm Enterprises (RNFE) in the Rural Economy



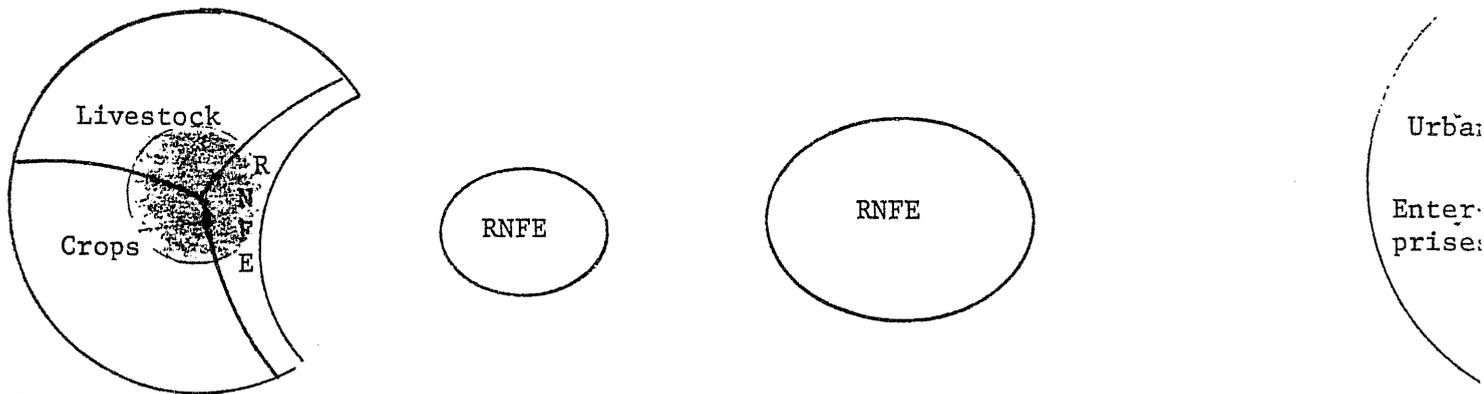
Time = 1



Time = 2



Time = 3



Time = 4

Rural Areas

Rural Villages

Rural Towns

Urban Areas

and resource exchanges. They trade goods and services with other family groups, and their share of consumption from own production declines. In parts of Africa, social controls develop through which certain ethnic groups or castes specialize in specific nonfarm activities such as metal work, tailoring, weaving, or other nonfarm activities (See, for example, Hill, 1967).

Initially, local exchanges among households are regulated by social protocols. Families exchange goods and services through socially monitored reciprocal giving. They transfer capital through rotating credit societies regulated by social norms and pressure (Bauman, 1977; DeLancey 1978a; Miracle, Miracle and Cohen, 1980). They exchange labor through reciprocal cooperative work parties (Erasmus, 1956, Moore, 1975).

Ultimately markets develop - labor markets, rural financial markets, and commodity markets. They operate alongside social allocation mechanisms and ultimately supplant them. But the time frame is very long. Even today in parts of rural Africa, families exchange as much labor through reciprocal work parties as they do through the hiring of nonfamily wage labor (Weinrich, 1975). And capital flows remain predominantly intra-family (See Tables 29 and 30). In virtually all of Africa, capital exchanges across families are channeled through rotating credit societies and other socially regulated institutions far more frequently than through formal financial markets (Miracle, Miracle and Cohen, 1980).

As specialization continues, some nonfarm enterprises split off from the farm household, the economic analog of mitosis. Evidence from Kenya, displayed in Table 19, suggests that transport, financial services and

TABLE 19

DEGREE OF ASSOCIATION BETWEEN RURAL NONFARM EMPLOYMENT
AND AGRICULTURE IN RURAL KENYA

<u>Activity</u>	<u>Percent of Rural Nonfarm Entrepreneurs Working At Least One Day Per Week In Agriculture</u>
Transport & Storage	14.80
Services: Financial	20.00
Metal Products	33.30
Services: Community	38.50
Wood Products	45.00
Repairing	50.00
Food, Beverage and Tobacco Products	53.20
Wholesale/Retail	60.60
Resource Extraction	66.70
Construction and Building Materials	66.70
Other Manufacturing	72.70
Fiber Production and Clothing	73.90

SOURCE: Kenya: IRS Nonfarm Module 2, 1977-78 (unpublished),
cited in Freeman and Norcliffe (1985) p. 71.

metal working are among the first activities to split off from the farm household, while weaving and tailoring, resource extraction and construction remain integrated longer.

The growing proportion of nonfarm economic activity and the emergence of independent nonfarm enterprise go hand in hand with spatial concentration of population in village centers and rural towns. The concentration of people and activities in village towns stimulates the emergence of primarily nonfarm households by generating a volume of demand sufficient to support specialized non-agricultural production units. Certainly all available evidence indicates dramatically higher proportions of nonfarm activity in rural towns than in dispersed rural settlements (See Matlon 1977, p.30; Liedholm and Chuta, 1976 p.42; Tables 20-23).

Moreover, the emergence of primarily non-farm households accelerates the move to a market economy. Given the difficulties of rural communication and transport, social norms and household heads become physically unable to exert control over input allocation and production decisions across distances. Hence the physical separation of farm and nonfarm activities accelerates the move to market exchanges of both inputs and outputs. Because they are specialized, nonfarm households are inclined to sell their wares for cash in order that they may purchase food and other necessities. Even in areas where farm production remains almost entirely consumed within the producing household, nonfarm goods are traded for cash (See Ancey, 1974 for evidence from Ivory Coast.) Sutter (1977) has suggested that the rise of nonfarm employment lies at the heart of the breakdown of the extended family system of economic resource management in

TABLE 20

DENSITY AND COMPOSITION OF AFRICAN RURAL NONFARM EMPLOYMENT, BY SIZE OF LOCALITY
(employment per 1,000 population)

	1. AGRIC.	2. NON-AG.	2.a. Mining	2.b. Mftr.	2.c. Constr.	2.d. Commerce*	2.e. Serv.	2.f. Non.Desig
<u>Benin, 1961</u>								
Rural	266	188	0	32	2	147	6	0
Urban	37	313	0	59	13	189	53	0
<u>Cameroon, 1976</u>								
Rural	359	42	0	10	4	7	13	8
Rural towns	142	152	0	27	11	41	60	12
Urban	8	270	1	52	24	81	95	18
<u>Chad, 1964</u>								
Rural	302	10	0	1	1	2	6	0
Rural towns	132	131	0	20	15	34	62	0
<u>Ghana, 1960</u>								
Rural	278	102	6	29	9	45	12	0
Rural towns	55	239	14	45	25	112	43	0
Urban	38	473	13	77	65	207	112	0
<u>Malawi, 1977</u>								
Rural	374	46	0	12	7	11	9	8
Rural towns	152	177	0	19	27	56	60	14
Urban	42	287	0	62	38	69	98	19
<u>Mali, 1976</u>								
Rural	334	30	0	12	0	3	5	10
Rural towns	112	128	4	25	5	32	53	9
Urban	29	207	9	23	11	53	101	11
<u>Mauritania, 1977</u>								
Rural	154	40	1	7	2	14	17	0
Urban	14	371	43	35	48	95	149	0
<u>Mozambique, 1980</u>								
Rural	451	44	0	23	2	8	12	0
Urban	122	241	0	76	11	71	82	0
<u>Nigeria, 3 Western States 1966</u>								
Rural	227	355	0	188	0	147	9	10
Rural towns	124	349	0	119	0	177	40	12
<u>Rwanda, 1978</u>								
Rural	544	28	3	7	4	3	11	1
Rural towns	324	185	0	20	14	37	110	3
Urban	149	364	3	39	70	68	174	9
<u>Senegal, 1970/71</u>								
Rural	121	26	1	9	1	10	5	0
Rural towns	111	69	0	15	3	27	24	0
Urban	16	170	1	28	10	55	76	0
<u>Sierra Leone, 1974</u>								
Rural	530	85	5	17	7	38	18	0
Rural towns	691	309	54	70	19	115	51	0
Urban	123	877	4	90	70	450	263	0
<u>Togo, 1970</u>								
Rural	312	107	0	20	5	28	8	45
Rural towns	71	268	1	51	17	94	42	63
Urban	10	384	0	64	23	118	93	86

*Includes transport plus commerce.

SOURCE: As in Table 16..

TABLE 21
COMPOSITION OF AFRICAN RURAL NONFARM EMPLOYMENT, BY SIZE OF LOCALITY
(percent)

	1. AGRIC.	2. NON-AG.	2.a. Mining	2.b. Mftr.	2.c. Constr.	2.d. Commerce*	2.e. Serv.	2.f. Non.Desig.	2.g. Total
<u>Benin, 1961</u>									
Rural	59	41	0	17	1	78	3	0	100
Urban	11	89	0	19	4	60	17	0	100
<u>Cameroon, 1976</u>									
Rural	90	10	0	24	9	16	31	20	100
Rural towns	48	52	0	18	7	27	40	8	100
Urban	3	97	0	19	9	30	35	7	100
<u>Chad, 1964</u>									
Rural	97	3	0	13	8	21	58	0	100
Rural towns	50	50	0	15	12	26	47	0	100
<u>Ghana, 1960</u>									
Rural	73	27	6	29	9	44	12	0	100
Rural towns	19	81	6	19	11	47	18	0	100
Urban	7	93	3	16	14	44	24	0	100
<u>Ivory Coast, Bouake Region 1963</u>									
Rural	96	4							
Rural towns	26	74							
Urban	11	89							
<u>Malawi, 1977</u>									
Rural	89	11	1	25	15	23	19	16	100
Rural towns	46	54	0	11	15	32	34	8	100
Urban	13	87	0	22	13	24	34	7	100
<u>Mali, 1976</u>									
Rural	92	8	1	40	1	9	15	35	100
Rural towns	47	53	3	20	4	25	41	7	100
Urban	12	88	4	11	5	25	49	5	100
<u>Mauritania, 1977</u>									
Rural	79	21	2	17	6	34	41	0	100
Urban	4	96	12	10	13	26	40	0	100
<u>Mozambique, 1980</u>									
Rural	91	9	0	51	6	18	26	0	100
Urban	34	66	0	32	5	30	34	0	100
<u>Nigeria, 3 Western States 1966</u>									
Rural	39	61	0	53	0	41	3	3	100
Rural towns	26	74	0	34	0	51	12	4	100
<u>Rwanda, 1978</u>									
Rural	95	5	9	23	13	11	40	3	100
Rural towns	64	36	0	11	8	20	60	2	100
Urban	29	71	1	11	19	19	48	3	100
<u>Senegal, 1970/71</u>									
Rural	82	18	2	34	4	38	21	0	100
Rural towns	62	38	0	21	4	40	34	0	100
Urban	8	92	0	17	6	32	44	0	100
<u>Sierra Leone, 1974</u>									
Rural	86	14	5	20	8	45	21	0	100
Rural towns	69	31	17	23	6	37	17	0	100
Urban	12	88	0	10	8	51	30	0	100
<u>Togo, 1970</u>									
Rural	75	25	0	19	4	27	8	42	100
Rural towns	21	79	0	19	6	35	16	24	100
Urban	2	98	0	17	6	31	24	22	100

*Includes transport plus commerce.

SOURCE: As in Table 16.

TABLE 22

DENSITY OF RURAL NONFARM EMPLOYMENT BY SIZE OF
LOCALITY, RURAL ZAMBIA 1985^a
(employment per 1000 population)

	Standard Enumerated Areas (dispersed)	Rural Towns 0-12,000 Inhabitants	Small Towns 12-50,000 Inhabitants	Total Rural, Six Provinces
<u>Manufacturing</u>				
1. Traditional beers	38.57	19.96	9.50	32.06
2. Sweet beer	2.34	3.83	1.98	2.20
3. Foods	3.11	11.46	9.38	3.71
4. Woodworking/ Charcoal	28.54	7.64	5.65	23.18
5. Garments	2.52	8.99	7.62	3.04
6. Metalworking	3.21	1.22	1.39	2.68
7. Ceramics	2.06	0.36	0.87	1.69
8. Leatherworking	0.37	0.77	0.63	0.38
9. Other	0.09	0.31	0.22	0.11
Total	<u>80.80</u>	<u>54.54</u>	<u>36.22</u>	<u>69.03</u>
<u>Commerce</u>				
1. Vending	7.10	42.39	43.37	11.07
2. Trading	2.29	14.72	13.96	3.63
Total	<u>9.39</u>	<u>57.11</u>	<u>57.33</u>	<u>14.70</u>
<u>Services</u>				
1. Bars/taverns	1.10	1.52	1.93	1.08
2. Restaurants	0.00	1.79	1.30	0.20
3. Repairs	0.64	2.42	2.60	0.83
4. Other	3.44	1.26	1.37	2.86
Total	<u>95.37</u>	<u>118.65</u>	<u>100.76</u>	<u>88.69</u>
<u>Grand Total</u>	186	230	194	172

^aThis study covered the rural areas of six of Zambia's eight provinces. Excluded were the Copperbelt and Lusaka provinces. The study area accounted for 60 percent of Zambia's population.

SOURCE: Milimo and Fisseha (1986), pp. 34, 47; and 1980 Population census data.

TABLE 23

DENSITY OF RURAL MANUFACTURING AND REPAIR
 EMPLOYMENT BY SIZE OF LOCALITY,
 SIERRA LEONE 1974
 (employment per 1,000 population)

	Size of Locality		
	Under 2,000	5,000- 20,000	Over 100,000
1. Tailoring	8.92	10.19	8.62
2. Carpentry	5.31	4.09	1.25
3. Blacksmithing	5.52	0.66	0.13
4. Matmaking	4.25	0.00	0.00
5. Spinning & weaving	2.55	0.27	0.00
6. Baking	1.49	1.25	0.59
7. Goldsmithing	1.06	0.45	0.20
8. Gara Dyeing	0.00	1.19	0.58
9. Wood carving	0.64	0.15	0.01
10. Vehicle repair	0.00	1.07	2.09
11. Shoemaking/repair	0.42	0.36	0.47
12. Welding and fitting	0.00	0.07	0.31
13. Watch repair	0.00	0.23	0.28
14. Radio repair	0.00	0.15	0.22
15. Other	0.85	0.76	3.49
Total	31.00	20.89	18.24

SOURCE: Liedholm and Chuta (1976), p. 15 and Thomas (1979).

Nigeria. Although causality is difficult to prove, and alternative explanations have been advanced (Norman, Simmons and Hays, 1982), there is little doubt that increasing nonfarm activity, a declining proportion of intra-household in total resource allocation decisions, and increased rural monetization go hand in hand.

In some cases, rural nonfarm activities do not develop organically from the specialization of polyvalent rural households but instead are implanted by outsiders. In fact, outsiders - Asians in East Africa, Lebanese and Greeks in West Africa, and white settlers in East and Southern Africa - have instigated much of the growth in African rural nonfarm activities. The source of growth in rural nonfarm activity - organic or implanted from outside - has strong implications for both the size structure and technology used in rural nonfarm enterprises.

Ultimately, rural nonfarm enterprises must face competition from the outside, either from enterprises in growing nearby rural towns or from urban or imported goods. Manufacturers, especially those producing easily transportable items, face the stiffest competition. Yet rural services remain insulated, because by their nature they are difficult to move across space. As economies mature, the magnitude and composition of rural nonfarm enterprises becomes dependent on the competitiveness of local suppliers. That competitiveness, in turn, depends on a host of factors that will be explored shortly.

2. State of the transformation

The evolution of Africa's rural economy has proceeded at differing rates across the continent. Even so, some general orders of magnitude can be attached to each of the key features of the structural transformation.

First, monetization of the rural economy measures a key feature of the transformation, the degree to which market sale of goods has supplanted intra-household exchange. Available evidence shows a surprisingly consistent 60% cash share in total rural transactions. Countries as diverse as Ivory Coast, Zambia, Uganda, Kenya, Tanzania and Burkina all fall within 3 percentage points of 60%; and only Sierra Leone has a monetized share of rural economic exchanges as low as 52% (ILO 1982i; ILO 1983d; Collier, Radwan and Wangwe, 1986; Bessel and Roberts, 1971; Massel and Parnes, 1969; Byerlee and King, 1977).

Disaggregating reveals substantial differences between rates of monetization of agricultural and nonagricultural commodities. Nonfarm entrepreneurs exchange the overwhelming majority of their goods and services for cash, while agricultural commodities are monetized to a smaller extent. Farmers commonly market 70% to 90% of their cash crops, although continent wide they sell only about 30% of all foodcrop production (FAO, 1986; Cleave, 1974). Foodgrain marketing ranges from about 15% of total production in the Sahel to 25% in humid Central and West Africa and as high as 50% in Zimbabwe (FAO, 1986; Cleave, 1974; Srivastava and Livingstone, 1983; Norman, Pryor and Gibbs, 1979; Delgado, 1979; Hedlund and Landahl, 1983; Wilcock and Chuta, 1982; Anthony et.al., 1979; Leurquin, 1960).

A second feature of structural transformation, diversification of the rural economy out of agriculture and into nonfarm activities, has proceeded at a variable rate across the continent as the data in Table 3 attest.

From those data, it appears that nonfarm income commonly accounts for about 30% of total earnings in rural Africa.

Economic mitosis, the splitting off of nonfarm enterprises from integrated agricultural households, constitutes a third feature of the transformation of Africa's rural economy. It measures the proportion of nonfarm activity that takes place in specialized nonfarm households, indicating roughly the magnitude of capital and labor flows among activities that must be regulated by markets or communal social mechanisms rather than by direct decision of an integrated household head. The rate of household specialization can be roughly estimated from Tables 1 and 2. Since 80 to 90% of Africa's rural labor force works in agriculture and since 30 to 50% works full or part time in nonfarm activity, 30 to 60% of the population must work in both. So as a rough general notion, we can suggest that about 45% of African rural nonfarm activity takes place within integrated farm-nonfarm households, while about 55% is run from specialized nonfarm firms. These magnitudes square well with specific figures available for rural Kenya (Mbithi and Chege, 1973).

Labor is a key factor of production in rural Africa. In fact, most observers identify peak season labor bottlenecks as the principal constraint to increased farm production (Eicher and Baker, 1982; Anthony et.al., 1979; Mellor, Delgado and Blackie, 1987). Hence, the effective functioning of labor markets is central to efficiency and growth. The current state of rural labor markets can be summarized in five propositions. First, the hiring of wage labor is more common in nonfarm than in agricultural enterprises. Nonfarm entrepreneurs commonly hire (or

apprentice) 50% to 70% of their workers from outside the family, while the figure in agriculture averages closer to 15-20% (Table 13; Eicher and Baker, 1982; Byerlee, 1980; Spencer and Byerlee, 1976; Norman, 1972)). Second, the use of wage labor in agriculture is far more prevalent in cash cropping regions than elsewhere. Cash crop farmers commonly hire on the order of 25% of total labor input (Cleave, 1974), while growers of food crops engage closer to 10% from outside the family (Cleave, 1974; Norman, Pryor and Gibbs, 1979; Matlon, et.al. 1979; Oates, 1984; Robertson and Hughes, 1978; Weinrich, 1974; Anthony et.al., 1979; Collier and Lal, 1986; Collier, Radwan and Wangwe, 1986). Third, from the foregoing we estimate that about 20% of Africa's rural labor force is channeled through labor markets (60% of nonfarm workers x a 15% employment share plus 15% of agricultural labor x an 85% rural employment share = 22% of rural employment), while household heads allocate the remaining roughly 80% directly within the family. Fourth, the prevalence of communal labor exchange has diminished precipitously in recent years (Moore, 1975; Erasmus, 1956; Cleave, 1974), today normally accounting for only about 5% of all farm labor input (Cleave, 1974; Norman, Pryor and Gibbs, 1979; Collier et.al. 1986; Weinrich, 1974) and probably less in RNFE where the practice appears limited to female labor exchange in rotating beer parties in Southern Africa (Curtis, 1973).

Finally, there is some debate about the efficiency of Africa's rural labor markets (Berry and Sabot, 1978; Collier, Radwan and Wangwe, 1986). While efficiency would undoubtedly improve with access to better rural communication and transport systems, it is evident that today's labor

markets do direct substantial flows of workers seasonally, regionally and internationally in a process that improves aggregate welfare. Box 1 gives an example of how efficiency gains arise from the specialization and labor market development that accompany the rural transformation.

Box 1. Efficiency Gains from Specialization in Rural Sudan

A recent study from Sudan (ILO, 1985f) highlights the benefits arising from economic specialization and the accompanying development of rural labor markets. It compares a matched set of Sudanese farm households, alike in all respects except that the second group has access to significantly greater nonfarm employment due, they speculate, to special skills and training not possessed by other households. Because of the nonfarm earnings, these households earn greater total income than their otherwise identical compatriots. The households with nonfarm earnings hire wage labor to replace family members absent from the farm, thus increasing their overall earnings by substituting low cost wage labor for family members who can earn far more off the farm. The hired farm laborers gain as well, presumably agreeing to work on others' farms only when wages exceed what they could earn elsewhere. Income gains to both groups not only raise rural income directly, they also generate additional rural incomes through their expenditures and the consequent second round consumption multipliers. Thus specialization motivates labor market development, labor markets facilitate specialization and the cumulative effect of this transformation is to directly increase rural incomes.

A review of rural capital flows completes our snapshot of the structure of Africa's rural economy. Available evidence indicates that well over 90% of all capital is channeled outside the formal banking system, either within families or across households through informal and traditional credit systems. The share of remittance income accruing to rural households - 11% of total rural income in Kenya, 13% in Botswana,

and 71% in Lesotho - attests to the importance of intra-family flows and the close links between urban and rural economies (Tables 5,7,9; Kenya, 1978; Colclough and Fallon, 1983; ILO 1982L). These magnitudes suggest that intra-family flows predominate in the rural economy. While data on sources of agricultural investment funds are scarce, analagous information from nonfarm enterprises indicates that family funds account for about 90% of investment capital (Table 29). Informal credit markets and socially regulated rotating credit systems do provide investment funds for equipment (Miracle, Miracle and Cohen, 1980); but they appear most common as sources of working capital and consumption. Studies in Nigeria have found rotating credit societies furnishing up to a third of rural traders' working capital needs (Table 30).

3. Changes in Rural Nonfarm Activity

a. Differences by size of locality

Consistent with this view of the structural transformation taking place in rural Africa, the empirical evidence in Tables 20 and 21 document the important role played by emerging rural centers. Because many census definitions of rural exclude towns as small as 3,000 and 5,000, these two tables maintain an urban category for countries whose data do not permit a three-tiered breakdown. In these cases, even "urban" areas include a large proportion of settlements that can be classified as rural towns.

The data paint a picture of dramatic increase in the importance of nonfarm activities in rural towns and urban centers. The only exception is Western Nigeria where unusual settlement patterns arise because of Yoruba cocoa farmers' preferences for town living (Berry, 1975). Their

urban domicile dilutes nonfarm employment densities in Nigeria's rural towns.

Comparing among nonfarm activities, Table 20 shows that the frequency of commercial and service employment increases by far most rapidly with size of locality. Moving from dispersed rural settlements to rural towns, commercial and service employment densities frequently grow by multiples of 5 and 10. Although manufacturing densities also rise, they more commonly grow by a factor of 2 or 3. Because commercial and service densities increase so much faster than manufacturing, the nonfarm employment percentages displayed in Table 21 report a declining proportion of manufacturing in total nonfarm employment as locality size increases.

But it is important to disaggregate, because within sectors - especially within manufacturing - some activities fare better than others. As Tables 22 and 23 show, some nonfarm activities fade rapidly as urbanization proceeds and local producers increasingly face competition from larger scale outside suppliers. Spinning, weaving, pottery, woodcarving and mat making decline dramatically in importance with locality size, undoubtedly the victims of competition from cheap manufactured substitute goods. At the other extreme, activities that flourish as town size increases include vending, trading, restaurants, food preparation, and repair work of all sorts.

Only one food processing activity runs counter to the trend of generally increasing employment density in larger rural localities. Zambian home beer brewing declines markedly with locality size. This results from government regulations severely limiting home brewing in and

from increased competition from factory-brewed indigenous beers, both of which pose a greater threat to home brewers in larger towns than in smaller settlements (Jules-Rosette, 1982). Thus policy, as well as the economics of production and distribution, can substantially influence the profile of rural nonfarm activity, in this case constraining by far the largest nonfarm employer in rural Zambia.

Middle performers in rural towns include tailoring, metal working and carpentry. Tailoring employment increases steadily with town size in rural Zambia. In Sierra Leone, it is necessary to add that along with essentially constant employment density across localities, tailors operating in larger settlements work longer hours and earn higher returns (Liedholm and Chuta 1976, pp.16,42,43). Blacksmithing appears most prevalent in small localities, probably because of proximity to farmer repair needs; while metal working activities requiring more substantial equipment investment and throughput to remain solvent are concentrated more heavily in the rural and urban towns. Carpentry can only be judged from the Sierra Leone data in Table 23, because the Zambian data unfortunately group carpenters together with charcoal manufacture. The Sierra Leone data do indicate a modest increase in carpentry activity in rural towns as compared with dispersed rural settlements.

Looking at the rural nonfarm economy from the consumer's viewpoint, rather than the producer's, Table 24 reinforces several notions from the business school marketing literature. Displaying data from Kenya, the table indicates that consumers are far more likely to procure inexpensive and frequently purchased items close to home. Hence they purchase

TABLE 24

SPATIAL DISTRIBUTION OF CONSUMER PURCHASES
IN RURAL KENYA, 1977
(percent households primarily purchasing
from each source)

<u>Source of Supply</u>	<u>Food</u>	<u>Clothing</u>	<u>Shoes</u>	<u>Pots/Pans</u>	<u>Beds/Tables</u>
1. Own holding	47	0	2	1	3
2. Other households	5	0	0	1	6
3. Rural shop (duka)	17	22	21	14	15
4. Market center	28	54	42	65	32
5. Town	2	24	35	19	45
Total	100	100	100	100	100

SOURCE: Integrated Rural Survey Nonfarm module, cited in Freeman and Norcliffe (1985), pp. 43-50.

virtually all food locally. On the other hand, they buy consumer durables, especially expensive and infrequently purchased items such as furniture, in rural towns where volumes are sufficient to sustain specialized carpentry shops. Furniture manufacturers, because their product is bulky (space-gaining) and difficult to transport gain considerable competitive advantage by producing close to the final consumer. Together, Tables 23 and 24 suggest that carpenters fare particularly well in rural towns where they can service a sufficiently large catchment area to sustain regular operation while transport barriers protect them from urban competitors.

b. Distance from urban centers

Evidence from Ivory Coast reinforces previously developed notions about which rural nonfarm activities are most likely to be bulldozed by competition from urban and imported manufacturers. Corroborating the locality size evidence in Tables 22 and 23, Table 25 indicates clearly that basket making and weaving diminish precipitously in importance with proximity to major urban centers. Pottery making also declines, although to a lesser extent. Because these activities constitute the three largest rural industries in Bouake Region, it is not surprising that manufacturing in the aggregate may fare less well than commerce and services as rural structural transformation proceeds. Certainly it is necessary to distinguish between declining industries - such as pottery, weaving, basket making, mat making, and wood carving - and ascendant manufacturing activities such as food processing, and to a lesser extent tailoring, carpentry and metal work.

TABLE 25

SPATIAL DISTRIBUTION OF RURAL MANUFACTURING
 BOUAKE REGION, IVORY COAST, 1970
 (employment per 1,000 population)

	Kilometers from Bouake (population 110,000)					Region
	0-10	10-15	15-20	20-25	25+	
1. Basketmaker	6.24	8.75	16.42	19.46	40.74	11.71
2. Weavers	9.73	11.70	13.76	15.72	17.75	10.14
3. Potters	2.65	4.62	3.83	3.38	4.22	2.97
4. Builders (cement)	2.75	2.86	1.89	1.77	1.90	1.79
5. Builders (banco)	1.68	1.76	2.21	1.25	1.06	1.33
6. Dyeing	0.00	0.53	2.30	6.79	1.90	1.58
7. Tailors	1.56	1.19	2.30	1.53	1.48	1.24
8. Wood carving	0.59	1.35	0.86	0.64	1.06	0.74
9. Carpentry	0.59	0.33	0.54	0.88	0.84	0.43
10. Shoemakers	0.00	1.47	0.09	0.00	0.84	0.43
11. Mechanics	0.25	0.20	0.90	0.76	0.42	0.40
12. Blacksmiths	0.25	0.25	0.63	0.64	0.23	0.31
13. Jewelers	0.00	0.08	0.00	0.12	2.74	0.25
14. Hairdresser	0.00	0.00	0.14	0.00	0.00	0.03
Total	26.21	35.17	46.00	53.06	75.24	33.37

SOURCE: Ancey (1974), p.116.

Figures 3 and 4 illustrates how locality size and distance from urban centers interact to affect the density of nonfarm activities. Because the spatial and size distribution of localities do not coincide, the two interact in influencing the pattern of nonfarm activity in any particular settlement.

c. Regional differences

Within countries, the resource base, rainfall, soil types, population density, and incomes vary dramatically among regions. So too does the composition and prevalence of rural nonfarm activity. Resource based activities, such as sawmilling and mining, and weight losing manufacturing processes such oil extraction and sugar refining are frequently tied to the region in which the raw material is located. Andrae (1981) and Freeman and Norcliffe (1985) document the locational tie between resource availability and sawmilling in Ghana and Kenya. And regional data from Sierra Leone show clearly that the importance of fishing income, a resource based rural nonfarm activity, varies dramatically among regions depending on resource availability (Matlon et.al., 1979).

Displaying data from Kenya, Table 26 documents the substantial regional variation in both the level and composition of rural nonfarm income. Freeman and Norcliffe (1985) suggest that high nonfarm earnings in Central Province mirror the greater level of agricultural prosperity in that region. With the aid of Panel 3 in Table 26, it is possible to explore their hypothesis further. While the very high level of wood manufacture in Central Province is clearly related to timber resources

Figure 3

Interactions between Locality Size and Location in the Composition of Rural Nonfarm Activity,
Bouake Region, Ivory Coast 1970

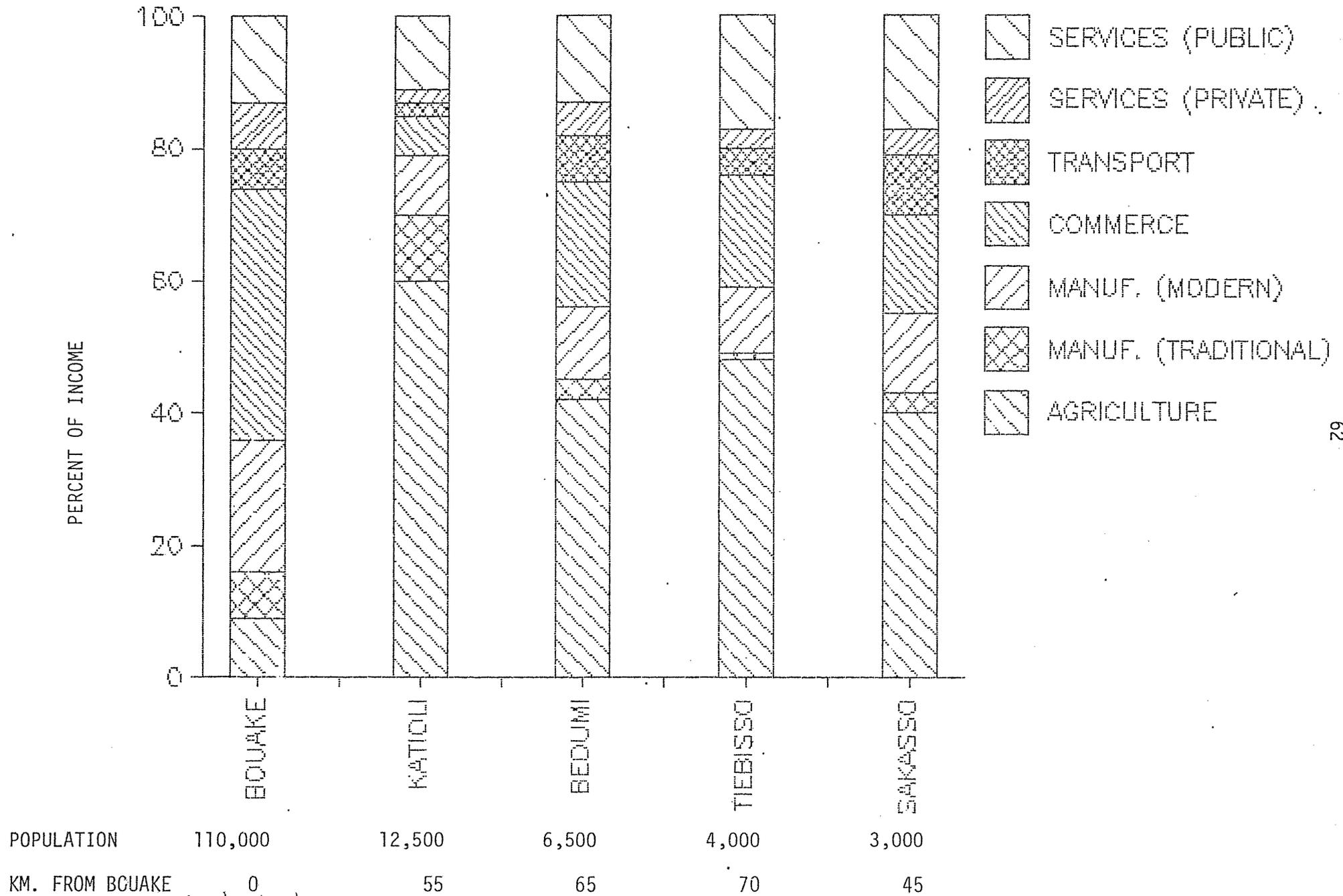


FIGURE 4

INTERACTIONS BETWEEN LOCALITY SIZE AND LOCATION IN THE COMPOSITION OF RURAL NONFARM ACTIVITY
KANO STATE, NORTHERN NIGERIA

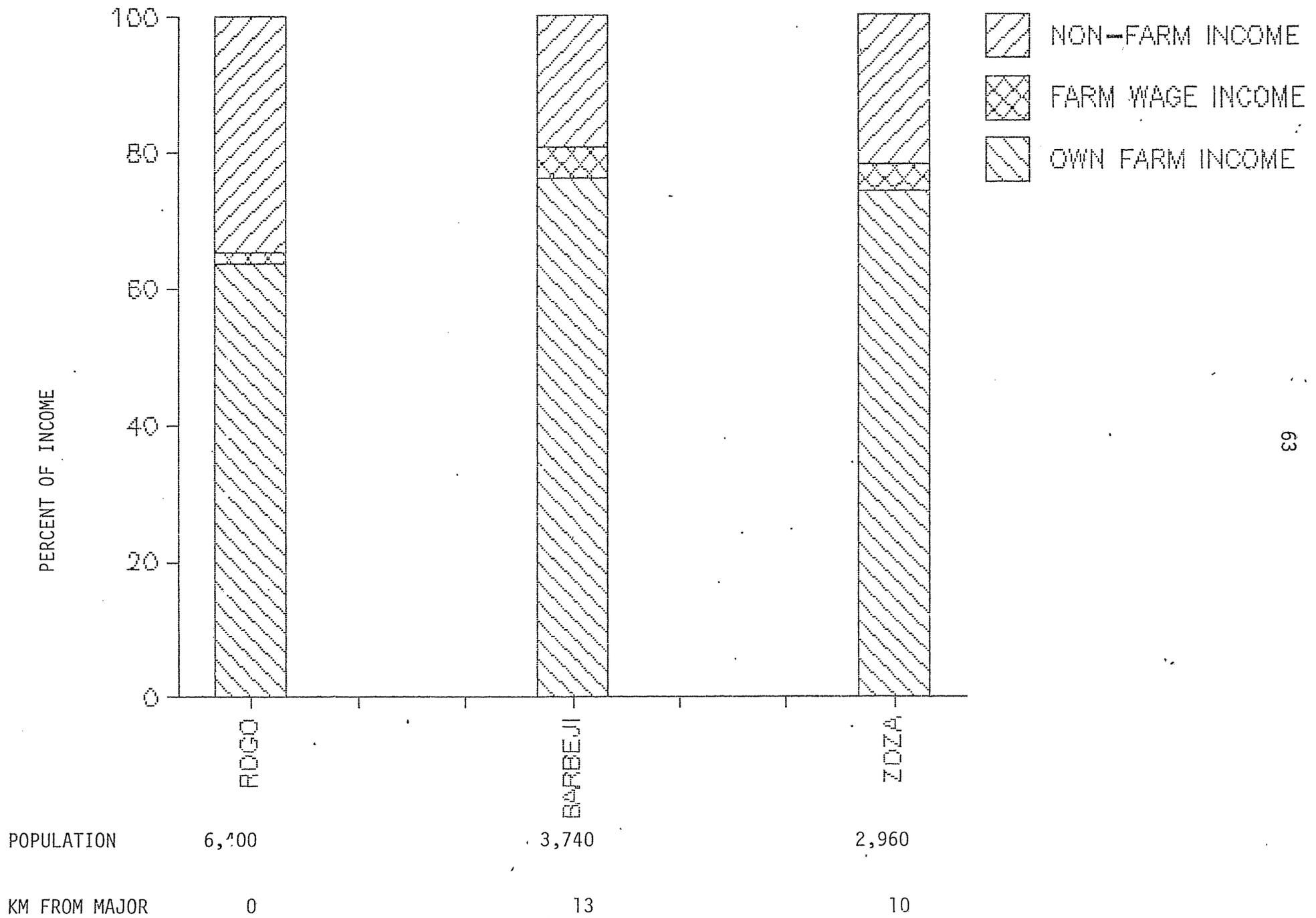


TABLE 26
REGIONAL DISTRIBUTION OF RURAL NONFARM ACTIVITY,
KENYA 1977/78

	Central	Coast	Eastern	Rift Valley	Nyanza	Western	Total Rural
1. Average Nonfarm Income/ Household (Kenya shillings)	461	425	329	405	437	394	403
2. Source of income per family holding (percent)							
a. nonfarm surplus	7	18	14	9	6	5	9
b. farm operating surplus	52	27	56	74	70	51	59
c. employment (ag + nonag)	29	27	20	13	19	27	22
d. remittances and gifts	12	27	10	5	5	17	10
e. Total	100	100	100	100	100	100	100
3. Percent of Population Involved in Each Nonfarm Activity							
a. resource extraction	8.2	6.6	13.5	24.9	5.1	16.0	13.0
b. food processing (brewing)	11.7 4.5	17.6 0.4	13.5 5.8	17.3 13.3	20.4 13.1	14.9 9.1	16.4 7.7
c. textiles and weaving	9.8	13.9	15.1	8.2	10.1	5.6	10.9
d. wood product manufacture	19.0	7.4	13.3	8.5	14.3	8.2	11.5
e. metal manufacture (blacksmith)	1.5 0.7	0.5 0.4	0.8 0.2	0.9 0.4	0.7 0.4	0.2 0.1	1.0 0.3
(farm implements)	0.0	0.1	0.2	0.3	--	0.4	0.2
f. trading	13.6	3.8	9.6	12.2	16.1	11.9	10.9
g. repairing (farm equipment)	8.0 0.1	6.7 0.0	6.0 0.3	7.8 0.1	9.0 0.5	10.5 0.2	7.8 0.2
h. other services	23.9	38.9	20.1	12.4	21.0	23.2	22.8

SOURCE: Government of Kenya (1977); Freeman and Norcliffe (1985).

rather than agriculture, the metal manufacture and repair data provide some tantalizing glimmers of evidence on backward linkages from agriculture. They suggest that implement manufacture, not large anywhere in rural Kenya, is virtually nonexistent in Central Province, the most densely populated region and that with the highest level of agricultural activity. But blacksmithing and farm equipment repair are twice as common there, albeit at low absolute levels. This suggests that agricultural prosperity may be more likely to bring with it repair linkages than implement manufacture. Of course the proximity of Central Province to Nairobi and the consequently easy penetration of urban manufacturers may prevent growth of rural manufacturing that would otherwise grow up in a more remote region. Given that Freeman and Norcliffe's data list percentages of enterprises, without any size weighting - by employment or value added - these suggestions can only be regarded as very tentative hypotheses. Ongoing work by Kilby (1987) may shed further light on regional differences in the informal sector segment of Kenya's rural nonfarm employment.

d. Changes over time

Time series data are limited and fragile. Nonetheless, those that do exist can be used to further explore the nature of Africa's rural structural transformation.

Using aggregate labor force data for major subregions of the world, both Anderson and Leiserson (1980) and ILO (1979c) make cautious judgements about long-term trends in rural nonfarm employment. They conclude that over the past 20 years rural nonfarm employment has been

growing more rapidly than agricultural employment in all regions of the world, including Africa. Therefore, they reason, the share of nonfarm activities in total rural employment has been growing as well. Although both sets of authors acknowledge the frailty of the underlying data, their conclusions are comfortingly consistent with the view of a rural structural transformation involving increasing specialization and diversification out of agriculture.

For individual countries, time series data on trends in rural nonfarm employment are limited to Sierra Leone, Rwanda and Kenya. All have their limitations but point in generally consistent directions. The Sierra Leone data are based on rigorous survey data of identical areas and firms, first in 1974 and subsequently in 1980 (Chuta and Liedholm, 1982). Unfortunately, sample sizes in the 1980 follow-up survey were not sufficiently large to permit inferences on trends in the most dispersed rural settlements, those below 2,000 in population. Nor do they include data for commercial, non-repair service firms, or for any enterprise employing over 50 workers. In practice the firm size cutoff should not pose a problem of incomplete coverage except in Freetown, the size category of cities over 250,000.

The results from Sierra Leone, displayed in Table 27, lead to several important conclusions. First, repair services and food processing have grown most rapidly, both overall and in small and medium sized rural towns. Second, while manufacturing in general appears to have declined in the smallest - the 2,000 to 20,000 person - localities, tailoring and welding have held constant; and they, along with carpentry, have grown

TABLE 27
TRENDS IN THE STRUCTURE OF NONFARM EMPLOYMENT,
SIERRA LEONE, 1974-1980

	Locality Size		
	2,000-20,000 ^a	10,000-25,000 ^a	250,000+ ^a
1. Repairs	15.0	5.2	15.0
a. Radio	22.0	19.0	b
b. Motor Vehicle	17.0	2.4	20.0
c. Watch	b	b	13.0
2. Food Processing	14.0	33.0	21.0
a. Bakery	3.4	14.0	32.0
b. Other	39.0	c	b
3. Woodwork	0.5	8.8	7.6
a. Carving	0.0	b	24.0
b. Carpentry	-0.6	8.6	3.6
c. Other	c	b	0.0
4. Clothing	-0.7	1.8	5.0
a. Tailoring	0.0	3.8	4.9
b. Tie Dyeing	-3.0	-8.5	b
c. Shoemaking	-4.3	16.0	6.2
d. Other	b	b	0.0
5. Metalwork	-5.8	9.4	10.0
a. Welding	0.0	23.0	6.6
b. Blacksmithing	-5.5	1.8	22.0
c. Goldsmithing	b	b	b
d. Other	0.0	0.0	0.0
6. Other Manufacturing	b	7.2	b
Total Small Manufacturing and repair	-2.4	6.0	5.7

^aCompound annual rate of employment growth.

^bGreater than zero but less than one percent.

^cValue for 1974 is zero.

SOURCE: Chuta and Liedholm (1982), pp. 104-105.

very rapidly in the medium sized rural towns, those between 20,000 and 250,000. These observations are consistent with the spatial evidence suggesting that repair services and food processing grow most rapidly with the development of rural towns. Tailoring, carpentry and metal working activity also increases, but more rapidly in middle-sized rather than very small rural settlements.

The Rwanda time series data, tracing changes in rural nonfarm employment between 1978 and 1983, are more conjectural than those from Sierra Leone, since they splice together two very different data sets, the 1978 population census and the results of a more recent agricultural census. The timing as well as availability of information on part-time and seasonal labor differed among the two studies. And because occupational classifications also varied, the author (Vanvalli, 1985) had to make some judgements about how to aggregate and compare the two sets. Perhaps because of its part-time nature, home beer brewing was excluded from the manufacturing employment classification. The exclusion is unfortunate since beer brewing is by far the largest generator of rural nonfarm income, accounting for about 6.5% of total national GDP (Rwanda, 1982). Possibly the exclusion of brewing in both the beginning and ending years will leave the results of the remaining sectors valid. The great advantage of the Rwanda data is that they provide a comprehensive view of the rural economy, including commerce, services and manufacturing.

With these caveats, the Rwanda data generate several interesting conclusions. First, they once again point to service, commerce and restaurants as the fastest growing nonfarm sectors. Construction has also

TABLE 28
TRENDS IN THE STRUCTURE OF RURAL NONFARM EMPLOYMENT,
RWANDA, 1978-1983

	Employment, Full-time Equivalents		Compound Annual Growth Rate
	1978	1983	
1. Personal Services	20,164	49,061	19.5
a. Servants	--	31,246	
b. Night Guards	--	17,815	
2. Commerce, Restaurants and Hotels	14,957	31,339	15.9
a. Import-Export	142	--	
b. Wholesaling	158	--	
c. Retailing	10,761	15,954	
d. Hotels, Bars, Restaurants	3,896	15,385	
3. Construction	16,219	29,108	12.4
a. Builders	14,241	18,923	
b. Plumbing and Water	247	3,000	
c. Bridges and Roads	1,575	7,185	
d. Other	156	--	
4. Manufacturing	29,144	48,647	10.8
a. Woodworking	6,439	17,492	
--Carpentry	--	16,338	
--Lumbering	--	1,154	
b. Brick and Tile Manufacturing	14,014	12,215	
c. Clothing	4,073	10,539	
d. Metalwork	1,079	7,069	
--Mechanics	--	3,062	
--Blacksmiths	--	1,831	
--Ferrailleur	--	1,185	
--Bicycle Repair	--	985	
e. Food Processing	3,019	1,338	
--Butchers	--	1,338	
f. Other	520	--	
5. Mining	11,389	11,000	0.0
6. Public Services	30,322	23,891	- 4.7
7. Transport, Storage	3,139	1,154	-18.0
Total Rural Nonfarm Employment	126,169	203,785	+10.1

SOURCE: Vanvalli (1985).

grown rapidly, perhaps because of major highway construction during 1983. Fourth fastest, but still apparently growing rapidly is manufacturing. Here, too, woodworking, metal work and textiles seem to have fared the best. The apparent decline in food processing, however, must be discounted because of the exclusion of home beer brewing.

Time series data from Kenya are limited to the "informal sector" enterprise censuses undertaken regularly since 1978 and the Census of Manufacturers which collects data every five years on firms employing 10 or more workers. Both surveys are run by the Central Bureau of Statistics (CBS), but by different divisions within CBS. While the raw data from both sets can, in principle, be broken down by province, locality, and size of locality, knowledgeable observers indicate that there is substantial overlap in their coverages. Hence it is not possible to marry the two sets together without double counting firms at the small end of the formal spectrum. This difficulty, common in many countries, precludes generation of a reliable recent time series - or even overall profile - for either rural, urban or aggregate nonfarm employment in Kenya.

Restricting his investigations to the informal sector, Kilby (1987) has begun exploring trends in Kenyan rural and urban nonfarm employment. His initial findings suggest a .98 correlation between informal sector employment (both urban and rural) and wage employment. From this, he tentatively concludes that activity in small scale manufacturing, service and commercial establishments is driven by demand generated by low income wage laborers.

In a further interesting observation, Kilby calls attention to a spurt in informal sector employment in 1984/85. He suggests it may be due to the imposition in 1984 of a 17% sales tax which large firms find more difficult to evade than do small enterprises. Once again, the power of policy interventions becomes measurable.

e. Conclusions

Although some of the data are fragile, both the time series and cross section evidence point to several key conclusions. First, services, commerce, and food processing activities are the largest, the most rapidly growing, and the most ascendant nonfarm activities in emerging rural towns. Within manufacturing, basket making, weaving and spinning, pottery and wood carving consistently show signs of decline, both spatially and over time. But manufacturing activities other than food processing and preparation - especially carpentry, tailoring and modern metal working - appear to grow as well, by filtering up to regional towns and out of dispersed rural settlements.

4. Correlates of Growth in the Rural Nonfarm Economy

Several features of the rural transformation clearly go hand in hand with growth in the economy's rural nonfarm component. First, the development of rural towns and the rise of nonfarm enterprises appear intimately intertwined. In part this may be due to the benefits of size - economies of scale and scope - as well as the prospects for centralized, cost effective provision of key productive and institutional infrastructure.

The level of infrastructure - roads, telephones and telegraph, electricity, water, banking and transport facilities - emerges as a second likely stimulant to the growth of rural nonfarm enterprises. With the development of a cash economy, information, people, and funds must be transmitted across space in response to differential needs and productivities. Decreases in the cost of information and transport flows can only improve the efficiency with which rural labor and financial markets channel inputs into activities yielding the highest returns. Moreover, decreased transport costs open up rural resources and markets to viable exploitation. This can only facilitate movement to a more specialized, productive rural economy.

Third, and also related, we expect that population density is also positively correlated with the level of development of the rural nonfarm economy. Population density makes possible more rapid attainment of minimum efficient scales for full-time specialization in given activities. And emergence of a service sector depends on close physical proximity between purveyors and clients.

Fourth we speculate that per capita income will be positively associated the level of rural nonfarm activity. Engel's Law mandates this tandem movement for the overall economy, and if definitions of rural remain liberal enough to encompass the nonfarm growth in rural towns, then increases in income will be reflected in an increasing share of nonfarm in total rural income.

Finally, and central for this review, is the relationship between agricultural production and nonfarm activity. For two reasons, we expect

growth in agricultural income per capita to be positively associated with increasing rural nonfarm activity. First, increased farm productivity is normally a precondition for rural specialization if labor is to be released to nonagricultural pursuits without lowering food production and intake in the rural community. And second, if rural growth multipliers exist, both the production and consumption linkages entrained by agricultural growth will stimulate the rural production of nonfarm goods and services in response. Consequently we hypothesize that, as in Asia, rising levels of rural nonfarm income will be in part caused by, and therefore correlated with, increases in farm income.

Empirical evidence presented in the preceding sections has provided strong support for Hypothesis 1 concerning the importance of rural towns in the development of rural nonfarm enterprises. Tables 20 and 21 furnish particularly persuasive documentation of the strong relationship between rural towns and rural nonfarm enterprises.

While data that would permit testing of Hypothesis 2 are not readily available, the example in Box 2 describes the key role rural towns and their infrastructure have played in the development of commercial gari processing in Ghana. The discussion in Box 2 draws heavily on a recent study by Kreamer (1986).

Box 2. Gari Processing in Ghana:
The Importance of Rural Towns in the Development of Rural Nonfarm
Enterprise

In less than ten years, Ghana's gari processing industry has surged to prominence in areas outside its traditional regional and ethnic strongholds. This rapid flowering - a response to successive years of drought - affords an unusual opportunity to view the stages and dimensions of the rural industrialization process that would

normally require review of a much longer time horizon.

Initially, growers themselves turned to processing their cassava to preserve its value. This nonfarm household activity was incorporated into the combined farm and nonfarm labor demands of the family; it was seen initially as an activity ancillary to agriculture. Production was seasonal, and countercyclical to farm labor demands.

The evolution to increasing degrees of specialization and stability of production is characterized by developments in three basic areas: markets, organization and technology. The development of each of these requires the presence of critical volumes of users, suppliers and support systems, all of which which require separating the enterprise from the farm family and locating in areas of concentrated activity, namely rural towns. Access to key infrastructure - transport and piped water - as well as organizational advantages of concentration proved particularly important to the emergence of gari processing in rural towns.

Marketing and Organization

In the case of gari, the process of specialization began with the move from grower-processors to independent processors. It was at this stage that raw material supply first appeared as a constraint, and the processors had to forego time in processing to travel about looking for supplies of cassava. Intermediaries emerged in the form of contractors whose function it was to assemble cassava in rural areas and bring it to processors. However, the volume of cassava required to support this function is much greater than the requirements of an individual processor. In the rural town, processors grouped themselves together into associations and appointed a representative, the secretary, who negotiates with contractors and oversees allocation of the cassava among members.

Only with the concentration of processors in the rural town could the efficiency of raw material marketing be improved in this manner. Similarly, being located in a trade and transport center, processors have access to information concerning other markets and developments which affect their enterprise. Moreover, they gain access to key productive infrastructure, particularly piped water. Some processors, or groups of processors through contractors, become assemblers of larger quantities of gari for transport and sale in more distant markets. In the first instance, the benefit of this initiative accrues to the processors or contractors who initiated the entry into distant markets, but geographic integration of the production, processing and distribution network in this manner progressively stabilizes supplies and prices.

Technology

In the traditional method of making gari, the only significant equipment is a rasp, against which the cassava is grated by hand, and a roasting pan in which the fermented and pressed cassava is cooked.

Grating of the roots is very time consuming and tiring work, and this proved to be the first bottleneck to processors who had adequate supplies of fresh roots. The same associations which were formed to improve the raw material supply of individual processors also serve an important role in the adoption of technology. The power grater has capacity far in excess of the needs of any one processor, and costs more than most could afford; but 20 to 25 processors grouped together can pay a small fee each to an entrepreneur to gain access to a power grater for the twenty minutes or so that will save four hours of manual labor. It is also common for this miller/entrepreneur to provide the custom services of a corn mill which is used to break up the lumps of intermediate product (Agbeliku and Gariku) which are otherwise normally thrown away.

There is another important role of the rural town in the technical transformation described above: it provides access to and interaction with the small scale manufacturers and metalworkers who can convert ideas and models from other location into the capital equipment required for technical innovation. Even where size and cost do not dictate any form of association among processors, their proximity to entrepreneurs in the capital equipment field will have a direct bearing on innovation. For example, a simple hand screw press has gained widespread popularity among gari makers. It is a simple adaptation from another processing activity, but it reduces the ardor and time required to extract the fluid during fermentation of the cassava. This interaction between manufacturers and the user of the equipment is a process of adaptation and innovation which, left to itself, results in the designs and capacity that best reflect their combined constraints and opportunities.

Thus the rapid recent expansion of Ghanaian gari processing took place in rural towns. The convergence there of infrastructure, technology and sufficient population densities enabled rapid response to new opportunities for rural nonfarm growth.

A sufficient number of cross section observations have been assembled to permit at least a crude initial attempt at exploring the third, fourth and fifth hypothesized correlates of rural nonfarm growth - population

density, per capita income and agricultural income per person. The plots in Figures 5, 6 and 7 display the relationships for the 15 countries for which data are available. The raw data appear in Table 16 and Appendix Table A.1. As would be expected given the differences in labor force definitions, and especially in the treatment of female employment, the data have considerable noise. And the narrow range of income and population densities lead to considerable bunching of the data, complicating inferences at higher income levels and population densities.

Nonetheless, there does appear to be a positive relationship between rural nonfarm employment density and all three hypothesized correlates. The population density plots in Figure 5 show a clear upward trend with the exception of Rwanda, the outlier in the lower right corner. Its extremely high population density, unusual topography and dispersed settlement pattern make Rwanda's rural economy atypical among African countries. Rural population is dispersed evenly across the country's one thousand hill tops and the few settlements of any size - even rural towns of only a few thousand in population - have been officially classified as urban by Rwandan census officials. Consequently, Rwanda's RNFE densities appear artificially low at the same time population density, extremely high by African standards, and a marked lack of rural settlements make it very much different than other countries. Apart from Rwanda, we see a positive correlation between rural nonfarm activity and population density.

Similarly, Figures 6 and 7 suggest a positive relationship between both per capita GDP and agricultural income on the one hand and RNFE

FIGURE 5

RELATIONSHIP BETWEEN RNFE AND RURAL POPULATION DENSITY

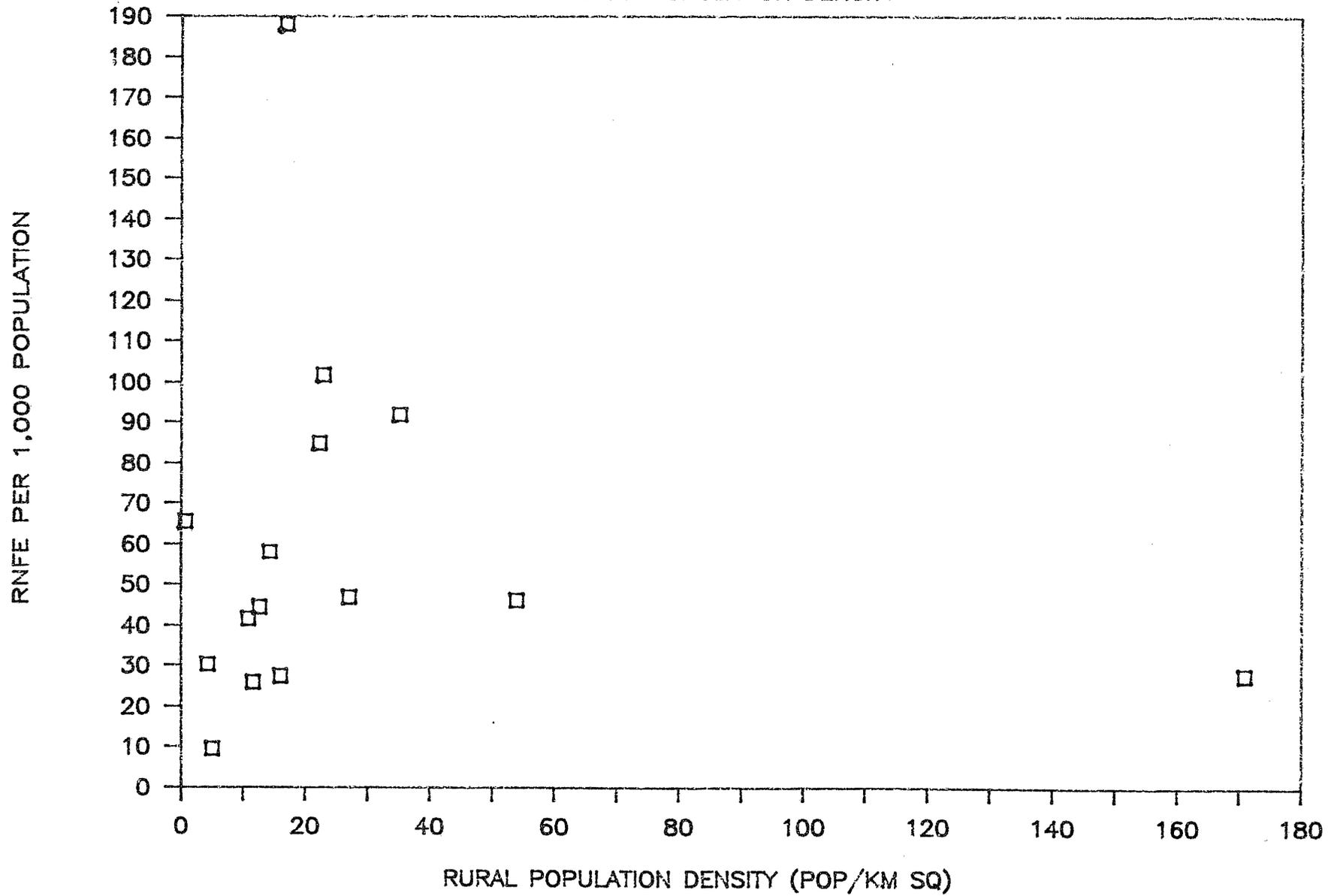


FIGURE 6

RELATIONSHIP BETWEEN RNFE AND GDP PER CAPITA

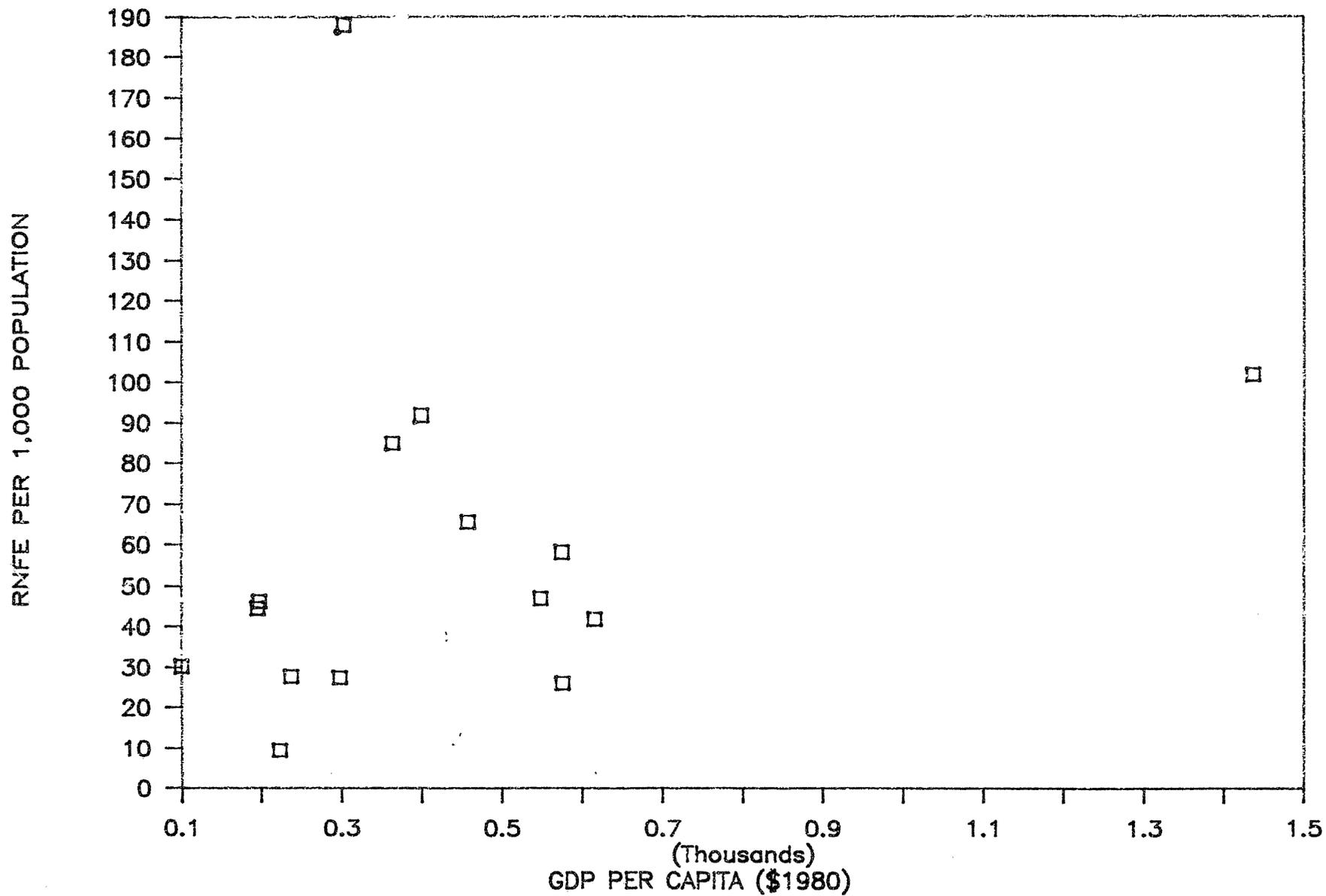
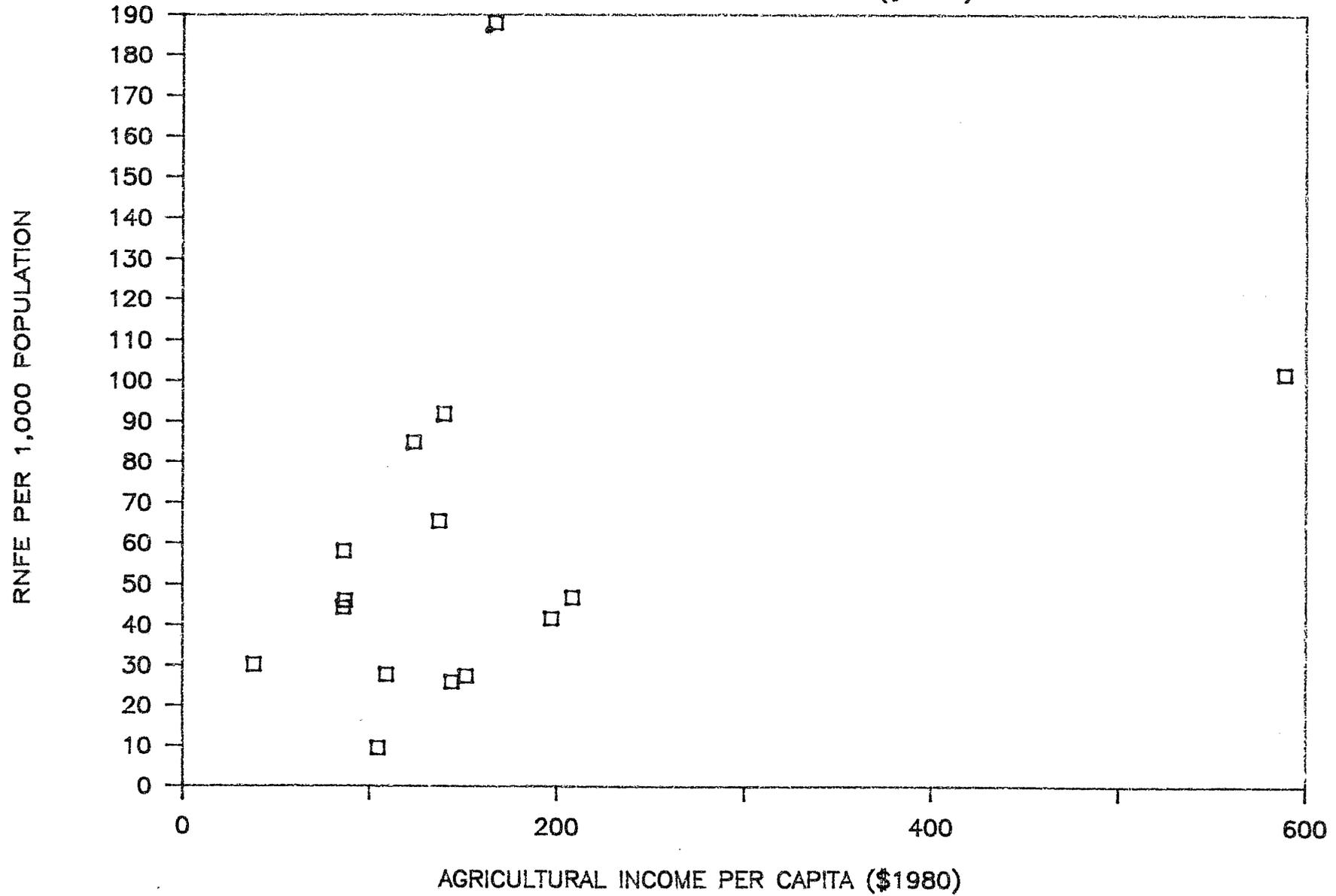


FIGURE 7

RELATIONSHIP BETWEEN RNFE AND AGRICULTURAL GDP PER CAPITA (\$1980)



density on the other. The first provides corroboration of structural transformation and the effect of Engel's law, while the second supports belief in rural agricultural growth linkages.

Because these cross-country comparisons are obscured by differences in definitions of rural, differences in measured female participation and different policy environments, a clearer way to isolate posited relationships would be to compare data among rural regions within a single country. We are fortunate to have the necessary regional breakdowns for rural Togo and rural Sierra Leone (ILO, 1982e; Matlon et.al., 1979). Displayed in Figures 8 and 9, they allow us to directly assess the relationship between farm and rural nonfarm income. The clear upward trend in Togo suggests that higher levels of nonfarm income are found in more prosperous agricultural regions. And the Sierra Leone data show a similar positive relationship between farm and nonfarm income with the exception of one outlier, a coastal region in which nonfarm fishing income accounts for over a third of total rural income. That resource based outlier apart, both countries show a strong correlation between per capita farm and nonfarm incomes across regions. Because nonfarm activities may be sustained by forces outside of agriculture - government or natural resources, for example - these correlations do not prove a causal link between growth in agriculture and growth in RNFE, but they are at least consistent with the belief in strong farm-nonfarm growth linkages.

FIGURE 8

REGIONAL CORRELATIONS

BETWEEN RURAL NON-FARM AND AGRICULTURE INCOME PER CAPITA
TOGO 1980

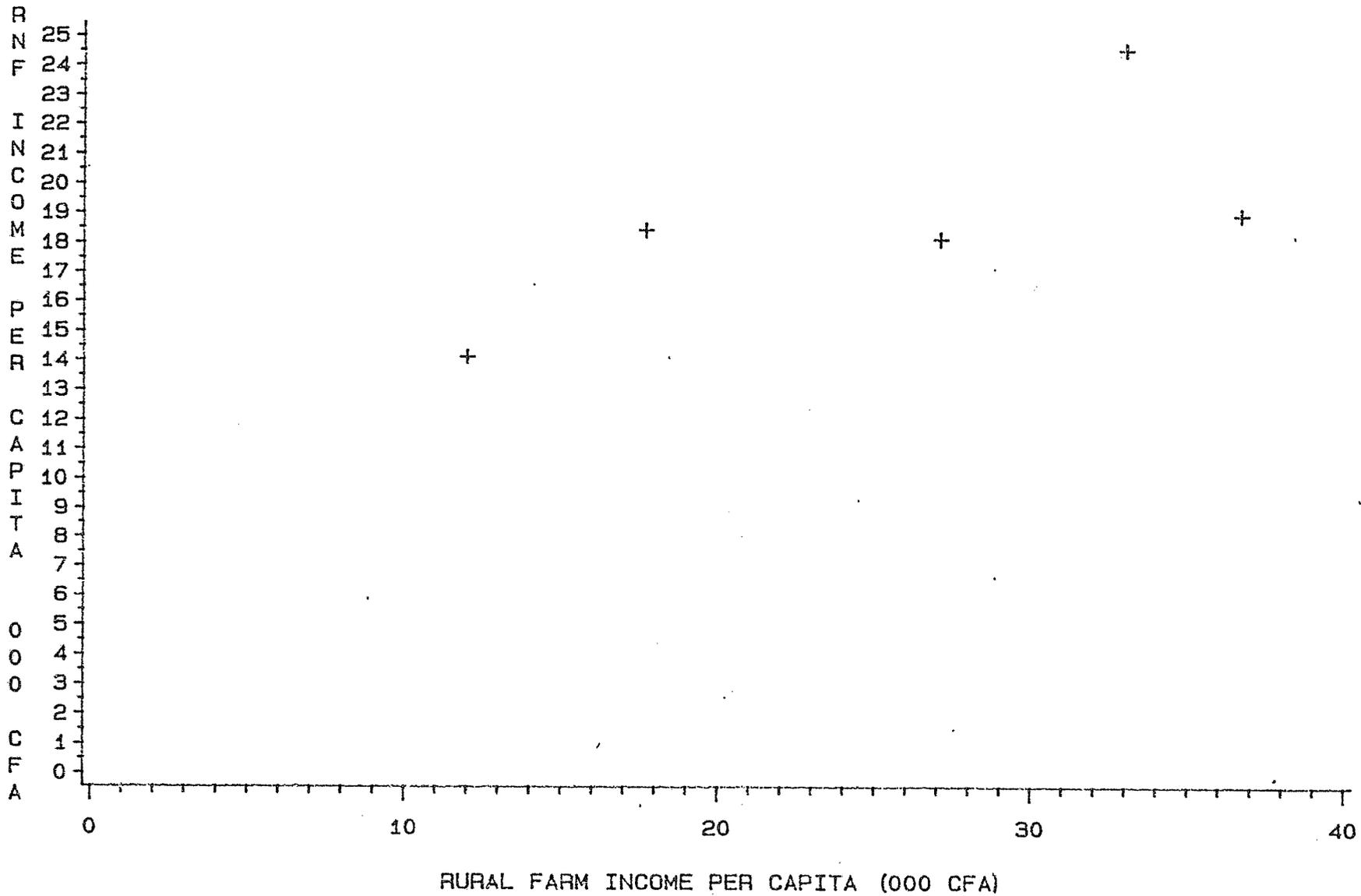
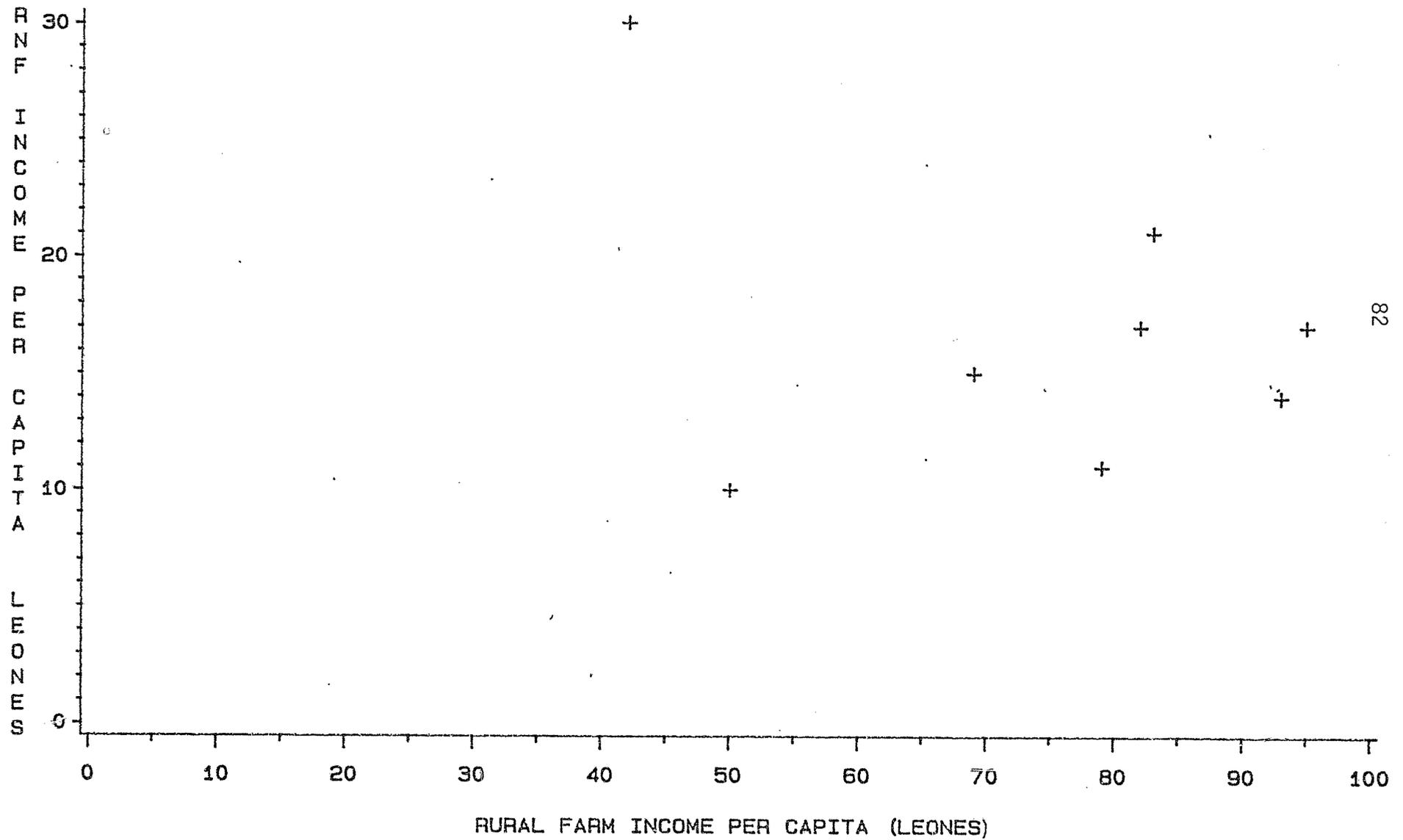


FIGURE 9

REGIONAL CORRELATIONS

BETWEEN RURAL NON-FARM AND AGRICULTURE INCOME PER CAPITA
SIERRA LEONE 1975



B. Magnitude of the Farm-Nonfarm Linkages

As a prerequisite for estimating the magnitude of agricultural growth multipliers, as well as an aid in gaining a fuller understanding of the nature of farm-nonfarm linkages, it is useful to examine in some detail available evidence on the strength of intersectoral linkages in rural areas. Five different linkages are important, two in factor markets and three in product markets. The factor market linkages involve capital and labor flows between agriculture and nonfarm enterprises. Product markets include backward production linkages from agriculture to nonfarm equipment suppliers, forward production linkages from agriculture to processors and distributors, and consumer demand linkages generated as a result of increasing farm incomes.

1. Capital flows

a. Investment of agricultural surplus in nonfarm activities

Although capital flows clearly move in both directions - from farm-to-nonfarm and from nonfarm-to-farm enterprises - most observers believe the outflow from agriculture to be the larger. Certainly at an aggregate level, a large accumulation of evidence suggests that surpluses have been consistently transferred out of agriculture through fiscal, crop pricing and trade policies (World Bank, 1981). Marketing boards and export levies typically tax away 30 to 50% farmer cash crop prices (World Bank, 1981). Because estimating the magnitude of total effective agricultural taxation remains a complex undertaking, few such calculations have been undertaken anywhere. While Lee (1971) and Ueno (1985) have computed the rates of resource extraction from agriculture in Taiwan and Japan, Sharpley (1981)

provides the only African evidence. Using data from 1969 to 1975, she finds steadily increasing government resource extraction from agriculture, resulting in 1975 in agriculture supplying 76% of the country's gross capital formation. Given the structure of government expenditures, it is very likely that most African governments have transferred these agricultural surpluses primarily to urban areas and into nonagricultural activities. And of course, many observers remain concerned about the productivity the investments made with those transfers (World Bank, 1981, 1983; Nellis, 1987).

Private investors also channel investment funds from agriculture to nonfarm activities. As shown in Table 29, evidence from Kenya and Sierra Leone suggests that agricultural surpluses account for between 15 and 40% of nonfarm investment funds. But since most survey teams do not explicitly ask rural entrepreneurs the sectoral origin of their investment funds, that figure may well be higher. Anecdotal evidence certainly suggests a frequent flow of funds from agriculture to nonfarm activities (Freeman and Norcliffe, 1985; Williams and McClintock, 1981).

b. Investment of nonfarm surplus in agriculture

Surpluses generated in nonfarm activities likewise furnish funds for productivity enhancing investments agriculture. Kitching (1977), in a review of sixteen farm management surveys from East Africa, finds repeated evidence of nonfarm earnings playing a crucial role in farmer acquisition of productive agricultural assets, especially land. The weight of the evidence, he believes, supports his hypothesis that previous nonfarm earnings is the single most important determinant of farm income. Collier

TABLE 29

SOURCES OF START-UP CAPITAL IN AFRICAN RURAL NONFARM ENTERPRISES
(percent of enterprises obtaining capital from each source)

Country	Own Savings		Friends & Relatives	Money Lenders	Banks	Other	Total
	Total	of which from Agric.					
Ghana, Rural Towns (1984)	0	--	87	3	7	3	100
Kenya, RIDC Clients (1972)	100	(16)	0	0	0	0	100
Nigeria							
(a) Kwara State (1970)	96	--	a	0	2	2	100
(b) Mid-West State (1970)	88	--	10	1	a	1	100
(c) Western State (1970)	98	--	2	a	a	0	100
Sierra Leone (1974)							
(a) Rural Towns	61	(14)	21	0	0	18	101
(b) Rural Areas	65	(38)	9	3	0	24	101
Tanzania, 20 Towns (1966/67)	78	--	15	0	1	7	101

^aLess than one percent.

SOURCE: Ghana: Yankton (1985).
Kenya: Child (1977).
Nigeria: Aluko et al. (1972) and (1973).
Sierra Leone: Liedholm & Chuta (1976).
Tanzania: Schadler (1968).

TABLE 30

SOURCES OF WORKING CAPITAL IN AFRICAN RURAL NONFARM ENTERPRISES
(percent of enterprises obtaining capital from each source)

Country	Reinvested Earnings Personal Savings	Money Lenders	Banks	Rotating Credit Societies	Friends and Relatives	Other	Total
Kenya, RIDC Clients (1972) ^a	86 ^b	0	0	0	0	14	100
Nigeria, Food Marketeers							
(a) Anambra State (1981/82)	12	11	3	12	21	41 ^c	100
(b) South Western (1981)	39	2	d	36	15	8	100
Sierra Leone (1974)							
(a) Rural Towns	73	0	0	0	0	27	100
(b) Rural Areas	77	12	0	0	0	11	100

^aCapital for expansion.

^b24 percent of which from reinvested earnings plus savings from agriculture.

^cIncludes loans from crops and trade associations.

^dLess than one percent.

SOURCE: Kenya: Child (1977).
Nigeria, Anambra: Adeyemo (1985).
Nigeria, Southwest: Olupokawbi (1981).
Sierra Leone: Liedholm and Chuta (1976).

and Lal (1986) reach a similar conclusion. They infer from Kenyan data that off-farm earnings, primarily urban wages, are the major correlate of agricultural innovation among farm families, presumably because nonfarm earnings supply funds for productive investment in agriculture. Berry (1975) reports a similar flow of nonfarm earnings playing an important role in the expansion of Nigerian cocoa farming in the 1930's and 40's. Likewise, Haugerud (1984) finds that nonfarm earnings are a key determinant of investment in Kenyan agriculture. And Massel and Parnes (1969), in explaining the extraordinarily high nonfarm earnings they found in Ugandan farm families, nonfarm earnings on the order of 65% of total household income, report similar conclusions. They indicate that a number of local businessmen had recently expanded from nonfarm business into agricultural enterprises, financing the agricultural expansion with nonfarm earnings. Because the farmers remained active in both sectors, nonfarm business accounted for a preponderant share of household income. The bulk of this admittedly fragmentary evidence comes from East Africa and appears frequently tied to investment in cash tree crops. But it does show that nonfarm to farm investment flows do occur with some regularity.

Ultimately, the fungibility of funds makes the question of source of investment monies irrelevant unless it can be argued that timing of nonfarm revenue availability makes them uniquely suited for investment transfers to agriculture. This may be the case for urban wage earnings, but since peak farm and rural nonfarm earnings coincide during the post harvest period, it is difficult to ascribe temporal liquidity advantages to rural nonfarm surpluses.

Because funds are fungible, probably the best way to measure the relative investment contributions from farm and nonfarm sources is to measure the contribution of each to rural cash incomes. Since the income shares from Table 3 indicate roughly a 30-70 split, it is probable that nonfarm earnings generate about 30% of rural investments, while agriculture shoulders the remainder of the load. Thus, while the nonfarm-to-farm flows may be very important in certain instances, the farm-to-nonfarm flows likely predominate.

2. Labor Flows

Labor in rural Africa regularly flows back and forth between farm and nonfarm activities. As Figure 1 indicates, and a host of other studies corroborate, nonfarm labor inputs move contracyclically to demands of the agricultural calendar. Competition for labor and the post harvest peak in nonagricultural demand combine to enforce this juxtaposition of peaks and troughs.

Tables 1 and 2 indicate that agriculture employs between 80% and 90% Africa's rural labor force. Nonfarm activity provides primary employment for the remaining 10% to 20% of rural laborers, as well as secondary employment for a further 20% to 30%. Combining these data with estimates of secondary employment in agriculture, we have estimated earlier (Section III.A.2) that 30 to 60% of the rural labor force works in both farm and nonfarm activities. This range represents the sizeable magnitude of the labor flows moving back and forth between the rural farm and nonfarm sectors.

Our earlier estimates suggest that about 20% of all labor flows pass through labor markets, including no more than 5% through communal labor exchanges. The remaining 80% of all rural labor is allocated within families by household heads.

3. Backward Linkages from Agriculture to Rural Input Suppliers

a. Current backward linkages

Agriculture requires production inputs, some of which can be supplied by rural enterprises. The Sierra Leone seasonal data clearly indicate that blacksmithing activity is at its peak during the height of the agricultural season because of the demand for repair services (Liedholm and Chuta, 1976). And the locality size data in Table 23 also indicate a predominance of blacksmithing in the communities below 2,000 in population, presumably because of the necessity of being near the farmers who require the repair services.

The type and magnitude of backward linkages varies depending on agricultural technology, size of holding, type of crop, and whether production is irrigated or rainfed. Appendix Table A.4 gives a feel for the range of differences among hand hoe agriculture and animal traction, small and large holder farms, tree crops and annuals, irrigated and rainfed cultivation.

In general the backward linkages appear to be weak, in all likelihood far weaker than those measured in Asia. To see why, recall that Johnston and Kilby (1975), in evaluating the magnitude of backward linkages in Asia, identify fertilizer, followed by equipment and finally cement and building materials as the three key production inputs to

agriculture. Fertilizer, by far the largest of these inputs in Asia, requires petroleum, huge amounts of capital and a large market to service. In Africa, probably only Nigeria can aspire to fertilizer production, while in the much larger Asian countries it may more frequently be possible. Of course, even where they exist, fertilizer production linkages are far more likely to be urban than rural.

Moreover, the second and third production linkages, cement plus building materials, and farm implements, are also likely to be less powerful in Africa than in Asia. Topography and hydrology severely limit irrigation potential in Africa. Shallow river basins coupled with low population density limit the potential for cost effective irrigation in most of Africa (Delgado, 1986). Hence the canal building and maintenance demanded in Asia is not required in Africa. The famous rural pump, engine and tubewell industries which blossomed in the Punjab are not likely to be induced in Africa where that equipment is simply not needed (Child and Kaneda, 1975).

Furthermore, animal traction and other farm implements are less prevalent in Africa than in Asia. Hand hoe agriculture prevails in the humid subtropical regions where tse tse flies prevent animal traction. Even in arid West Africa, where disease does not threaten livestock, only about 10% of all households practice animal traction (Mellor, Delgado and Blackie, 1987; Ohm, Nagy and Sawadogo, 1985). Of course temperate climate and history lead to far higher rates of animal traction - and even mechanization - in East and Southern Africa. The equipment inventories displayed in Table 31 indicate that the prevalence of animal traction

TABLE 31

INVENTORY OF SMALL FARMER EQUIPMENT IN
SUB-SAHARAN AFRICA: PERCENT OF FARM
HOUSEHOLDS OWNING EACH ITEM

	<u>Botswana</u> 1975-76	<u>Gambia</u> 1981	<u>Tanzania</u> 1981	<u>Zimbabwe</u> 1982
Small hoe	--	--	97	--
Large hoe	--	--	35	--
Axe	--	--	87	--
Machete	--	--	83	--
Plow	69	44	--	83
Planter	6	73	--	8
Cultivator	4	40	--	54
Wagon or cart	11	24	--	43
Tractor	--	--	--	5

^aThree Rice Growing Regions.

^bEight Villages.

^cTwo Regions.

SOURCE: Botswana: Chernicovsky, Mueller and Lucas (1985);
Gambia: ILO (1985c); Tanzania: Oates (1984); and
Zimbabwe: ILO (1985g).

rises to between 50 and 90% in those regions. Debates continue over the profitability of both mechanization and animal traction (Sargeant et.al. 1979; Jaeger, 1986; Johnston, 1981; Binswanger, 1982 and 1985).

b. The future

Of course, the potential for production linkages lies not necessarily in today's technology but in what will be required to generate the first round of agriculturally propelled growth tomorrow. Much like the two shoe salesmen visiting a country of barefoots, two very different conclusions can be drawn from the current low rate of product utilization. The optimistic salesman concludes that the market potential is huge, while the other dismisses prospects as dismal citing the absence of a proven clientele. Johnston (1981) stands most visible among optimists. Evaluating the prospects for agricultural equipment manufacture in Kenya he states, "The magnitude of the potential market is suggested by the fact that an estimated 84% of Kenya's arable area is still cultivated with hand tools compared to 12 percent cultivated with oxen and 3.5% by tractors." But a close reading of even his review of prospects for equipment manufacture in East Africa reveals that his only examples come from China and Taiwan.

The question of what tomorrow's technology will look like is difficult to answer definitively. It is increasingly clear that peak season labor bottlenecks constrain output in most areas, so some form biological or mechanical solution will have to address that problem area (Eicher and Baker, 1982; Mellor, Delgado and Blackie, 1987). If the most economic solutions turn out to be mechanical, backward nonfarm linkage

multipliers may grow. The multipliers computed below use a range of estimates of equipment inputs to generate a sense of the magnitude of the growth linkages that can be reasonably expected from this quarter.

c. Idiosyncratic design adaptation

Over and above the employment and income multipliers, Kilby and Liedholm (1986) propose one further virtue of rural nonfarm equipment suppliers. Using examples from India, Taiwan and Thailand, they point to prospects for "idiosyncratic design adaptation", the tailoring of equipment to local soil and topography. They describe how interaction between farmers and rural blacksmiths led to development of Thailand's Prapradaeng power tiller and a wide array of highly specialized agricultural implements in Taiwan. While government sponsored implement research is underway in numerous African countries (Eicher and Baker, 1982; Johnston, 1981; World Bank, 1986), only in Ghana do we have tentative evidence of private sector design adaptation for agriculture. A rotary punch planter for maize was apparently successfully adapted from a prototype obtained from the International Institute for Tropical Agriculture in Nigeria (Quansah, 1985). Even here, a technical institute in Kumasi appeared to play a key role.

Much better documented are examples of successful innovation on behalf of rural nonfarm enterprises. Kilby (1962) describes how experimentation around 1920 by a Nigerian baker and metal worker led to domestic production of a dough brake at 20% of the cost of the imported article, launching development of the entire Nigerian bread industry. Kreamer (1986) describes how similar interaction between gari processors

and metal workers in Ghana led to development of low cost presses as well as simple mechanical graters, both of which were instrumental in expansion of the industry (See Box 2). Analogous efforts have led to development of inexpensive strainers used by home beer brewers in Botswana (Haggblade, 1984).

4. Forward Linkages from Agriculture to Processors and Distributors

The forward linkages from agriculture to local processors and distributors appear to be far larger than those on the input side. Table 32 attempts to break out current rural nonfarm activity into three categories - those activities unrelated to agriculture, those supplying inputs and those processing outputs. Because many firms service a multiplicity of clients, this is not possible to do with great precision. Metal workers, for example, fix bicycles, automobile parts, and manufacture gates, door hinges and bars for windows. The problem is most severe with commerce. Much rural commerce clearly involves distribution of domestically produced agricultural goods. But a large share also distributes goods imported into the rural regions, both consumer goods as well as equipment.

Three conclusions emerge from Table 32. First, input supply is far smaller than the forward processing linkages from agriculture. Even if all metal working, blacksmithing and metal repair were related to agriculture, the forward processing and distribution links would be at least 10 times as great. Food processing is clearly important. Although bread baking is based on imported wheat flour, virtually all other processing activities involve transformation of local agricultural

TABLE 32
 PROBABLE RELATIVE MAGNITUDE
 OF BACKWARD AND FORWARD AGRICULTURAL LINKAGES IN RURAL AFRICA

1. Backward Linkages from Agriculture								
	Implement Manufacture	Implement Repair	Distribution		1. Total			
			Imported Inputs					
Zambia (1985) ^a								
a. Dispersed Settlements		3.21	--		3.21			
b. Rural Towns - 12,000		1.22	--		1.22			
c. Rural Towns - 12,000-50,000		1.39	--		1.39			
d. Total Rural		2.68	--		2.68			
Sierra Leone (1974) ^a								
a. Settlements under 2,000		5.52	--		5.52			
b. Rural Towns, 5,000-20,000		.73	--		.73			
Kenya (1977) ^b								
Central Province	.23%	5.52%	2.11%		7.86%			
2. Forward Linkages from Agriculture								
	Food Processing	Restaurants	Butchers	Leather- work	Distribution		2. Total	2/1
					and Storage ^c			
Zambia (1985) ^a								
a. Dispersed Settlements	44.02	0.00	--	.37	4.23	46.82	15	
b. Rural Towns - 12,000	35.25	1.79	--	.77	25.70	63.51	52	
c. Rural Towns - 12,000-50,000	19.86	1.30	--	.63	25.80	47.59	34	
d. Total Rural	37.97	0.20	--	.38	6.60	45.15	17	
Sierra Leone (1974) ^a								
a. Settlements under 2,000	0.00 ^d	--	--	--	--	--	--	--
b. Rural Towns, 5,000-20,000	0.00 ^d	--	--	--	--	--	--	--
Kenya (1977) ^b								
Central Province	5.86%	---	4.34	3.75 ^e	5.05	19.00	2.4	

TABLE 32 (CONT.)

^aSix Provinces: Employment per 1,000 population.

^bPercent of rural nonfarm enterprises.

^cDistribution and trade estimated equal to locally produced foods share of total rural cash expenditure. Taking 30 percent as a common share of cash in total food expenditure, and a total (cash plus subsistence) average budget shares of .70 for locally produced food and .05 for imported food, yields a 45 percent share of locally produced foods in total rural cash expenditure.

^dOnly baking enumerated among food-processing activities. Baking is based on imported wheat flour.

SOURCE: Zambia: Milimo and Fisseha (1985); Sierra Leone: Liedholm and Chuta (1976); Kenya: Freeman and Norcliffe (1985).

production. Brewing is the largest nonfarm employers in many of the countries for which we have evidence, for example Zambia, Burkina, Botswana and Rwanda. Milling is also consistently important. Oil extraction, sugar production, tea drying and packaging, coffee and cocoa dehulling and drying are often performed in rural areas by large scale enterprises. And while we know these large scale activities take place predominantly in rural areas, the small scale orientation of much of the past research causes those activities to elude the statistical net. Hence even substantial figures in Table 32 understate the magnitude of rural agroprocessing.

Distribution of agricultural products generates undoubtedly the largest of the nonfarm production links to agriculture. Retailing is a labor intensive activity which accounts for a majority of female employment in much of West Africa (see sources to Tables 1 and 2). If retailing of local agricultural produce is approximately proportional to the share of marketed production in total rural consumer cash expenditure, then about 45% of rural retailing can be assumed to be a forward distribution link from agriculture. That would put the forward linkages over 10 times the backward links imply that roughly two-thirds of the forward links come from distribution, the remainder from processing.

5. Consumption Links

In a dynamic situation where farm incomes are increasing, the consumer demand linkages emanating from these increases have the potential to be an important stimulant to the growth of the rural nonfarm economy. As per capita incomes rise, the demand for local services (especially transport, personal services, home improvement and religious functions)

and higher quality foods (especially livestock and horticultural products) typically increases more rapidly than the demand for foodgrains. The Asian experience suggests that the production of these commodities and services is labor intensive, hence rural employment in the non-foodgrain sector increases quite rapidly with per capita farm incomes (see for example, Mellor 1976; Gibb 1974; Bell, Hazell and Slade 1982). These patterns of growth may depend on a combination of high population density and adequate transport facilities to make rural services accessible to the villages, and so may be less applicable to large parts of Sub-Saharan Africa. One might hypothesize that in the absence of relatively cheap, labor-intensive goods and services in rural areas, then as per capita incomes increase, demand will shift less rapidly from foods to services in Sub-Saharan Africa than in Asia, with consequent weaker demand linkages to the rural nonfarm economy.

Although there have been numerous household expenditure surveys in Africa (See Table A.3), these are generally difficult to compare because of differences in the way income or expenditure is measured, differences in household definitions and the time period covered, differences in commodity groupings, and differences in functional forms used to estimate marginal propensities and income elasticities. In addition, few studies compute any measures other than average budget shares. Of the available studies, the most comparable were undertaken for farm households in Gusau, Northern Nigeria (Hazell and Roell 1983), rural households in Sierra Leone (King and Byerlee 1977), and households in three villages in Zaria Province, Northern Nigeria (Simmons, 1976). These are summarized in Table

33 together with comparable results for farm households in the Muda region of Malaysia (Hazell and Roell 1983) and North Arcot district, South India (Hazell and Ramasamy, 1986).

Expenditures patterns in Gusau, Northern Nigeria and rural Sierra Leone are very similar. The three villages Simmons studied in Zaria Province were deliberately chosen because of their close location to the urban center of Zaria, and as a consequence they have easier access to off-farm employment and to a wider range of consumer goods and services than are available in most rural villages in Africa. Not surprisingly, the expenditure patterns in these villages are quite different from those in Gusau and Sierra Leone, with greater diversification of the budget into nonfoods, especially services. Unfortunately, data on consumption of manufactured goods are not reported.

While there is a basic similarity in the breakdown between food and nonfood aggregates in Gusau, rural Sierra Leone and North Arcot, the most significant difference is that the South Indian households allocate substantially larger shares of incremental income to services and social and religious obligations, largely at the expense of food. This difference provides support for the hypothesis that services are more cheaply available in Asian countries, though a more rigorous test would also require allowing for possible differences in per capita income levels.

The Muda region is visibly richer than Gusau, rural Sierra Leone or North Arcot. This is reflected in the more inelastic demand for food and the greater diversification of the average and incremental budget into

TABLE 33

RURAL HOUSEHOLD EXPENDITURE BEHAVIOR IN SELECTED COUNTRIES

Commodity Group	Average Budget Share					Marginal Budget Share					Expenditure Elasticities				
		Rural	Zaira		North		Rural	Zaira		North		Rural	Zaira		North
	Gusau N. Nigeria	Sierra Leone	Province N. Nigeria	Muda Malaysia	Arcot S. India	Gusau N. Nigeria	Sierra Leone	Province N. Nigeria	Muda Malaysia	Arcot S. India	Gusau N. Nigeria	Sierra Leone	Province N. Nigeria	Muda Malaysia	Arcot S. India
Food Alcohol and Tobacco	80.7	73.7	56.5	66.7	78.2	76.1	67.9		37.7	63.0		0.94	0.92	0.57	0.81
Clothing and Footwear	7.2	7.0	11.4	5.8	4.2	8.9	7.4		8.1	7.7		1.24	1.06	1.39	1.85
Consumer Expendables	4.3	--	--	3.4	3.1	4.4			3.7	2.4		1.02	--	1.09	0.77
Housing	0.3	--	2.6	4.1	n.a.	0.4			12.4	n.a.		1.40	--	3.02	n.a.
Transport	1.9	2.2	1.3	1.8	2.8	2.7	3.0		3.1	3.4	--	1.41	1.36	1.67	1.22
Durables	1.1	--	2.1	0.6	1.4		7.1		1.9	1.25		3.35	3.43	--	
Education and Health Services and Social and Religious Obligations	1.1 3.3	1.4 4.3	-- 13.5	2.9 13.1	1.9 9.1	1.6 4.4	0.8 8.1		5.2 22.7	2.4 19.3		1.42 1.33	0.57 1.88	1.79 1.73	1.26 2.12
Locational Group															
<u>Locally Produced</u>															
Foods	75.3	69.0	--	46.4	63.0	70.3	66.1		24.6	48.5	0.93	0.96	0.53	0.77	
Nonfoods	8.4	8.8	--	18.1	17.4	11.3	12.3		36.9	30.8		1.34	1.40	2.05	1.77
<u>Regional Imports</u>															
Foods	5.4	--	--	20.3	12.3	5.8	--		13.1	12.0	1.07	--	0.65	0.98	
		22.2				21.6							0.97		
Nonfoods	10.9	--	--	15.3	7.4	12.6	--		25.4	8.6		1.16	--	1.66	1.17
Nontradables	24.7	--	--	23.5	17.5	32.0	--		40.6	24.1		1.30	0.87-1.62	1.73	1.37

SOURCE: Gusau, Northern Nigeria, 1976-77 (Hazell and Roell 1983).
 Sierra Leone, Rural (King and Byerlee 1977).
 Zaria Province, Northern Nigeria, 1970-71 (Simmons 1976).
 Muda, Malaysia, 1972-73 (Hazell and Roell 1983).
 North Arcot, South India, 1982-83 (Hazell and Ramssany 1986).

nonfoods. Note also the similarity of the importance of services in the budget to North Arcot and Simmon's three villages near Zaria. Again, the ready availability of labor-intensive services may be an important determinant of revealed expenditure behavior.

In the lower part of Table 33, commodities have been grouped by their location of origin. Tradables and nontradables are defined with respect to the regions studied; they are not necessarily tradables or nontradables in the international markets. To a regional economy, local household expenditures on imported goods (from outside the region) represent a direct leakage which reduces the size of the local income and employment multipliers. But as Siamwalla (1982) has argued, if incremental income is spent on locally produced goods that could be exported from the region at a constant price, that expenditure represents a loss in export proceed and is as much a leakage as if the money were expended upon imported goods. Thus the stimulative effect of increased household expenditure on the local economy depends crucially on the expenditure share allocated to locally produced goods and services that are also nontradables.

The average budget share for regional nontradables is about the same in Gusau as in Muda, and a little higher than in North Arcot. At first blush, this would suggest that the stimulatory effect of the consumption linkages on the local nonfarm economy should be about the same in the three regions. However, local nonfoods are about twice as important in the composition in the two Asian cases. The difference is even more exaggerated in the marginal budget shares; the share of incremental income allocated to local nonfoods is about three times larger in Muda and North

Arcot than in Gusau. The results for rural Sierra Leone also seem to confirm that the demand for local nonfoods is greater in Asia than in Africa. Consequently, whether the demand linkages for local nontradables are as important in Africa as in Asia for the generation of indirect rural employment seems to depend critically on the labor intensity of the local nontradable foods demanded. In Asia, these products (mostly livestock and horticultural crops) tend to be labor-intensive and remunerative to the poor. In Gusau and Sierra Leone there is little direct evidence, but certainly livestock are kept largely under extensive, if not nomadic, grazing systems which are not noticeably labor-intensive. However, these are important issues which need to be examined with more detailed studies than can be mustered here.

The importance of the availability of nonfood goods and services as a determinant of the household expenditure patterns becomes even clearer when the expenditure behavior across income deciles within countries is compared. Tables 34 and 35 summarize the relevant findings reported by Hazell and Roell for Gusau and Muda.

In Muda, the marginal budget shares for all food groups decline sharply between the bottom and top per capita expenditure deciles. The marginal budget share for total food, alcohol, and tobacco declines from 67 percent for the bottom decile to 14 percent for the top decile. The decline is particularly sharp for cereals and cereal products, and hence, for home-produced foods.

In contrast, the marginal budget share for total food, alcohol, and tobacco does not change significantly between expenditure deciles in

TABLE 34

MARGINAL BUDGET SHARES BY PER CAPITA EXPENDITURE
DECILE IN MUDA, 1972/73
(in percents)

Group	Per Capita Expenditure Decile									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Commodity group										
Food, alcohol, and tobacco	67.39	57.94	51.98	49.61	45.57	41.88	37.63	35.27	27.71	13.89
Cereals and cereal products	21.88	18.42	15.64	15.34	13.41	12.27	10.39	9.43	6.22	10.53
Fruits, vegetables, and nuts	9.85	8.75	8.30	8.02	7.60	6.98	6.79	6.49	5.94	4.42
Meat and fish	12.19	10.54	9.52	9.11	8.52	8.17	7.24	7.16	5.73	3.46
Eggs and dairy products	2.61	2.38	2.14	2.01	1.85	1.76	1.57	1.52	1.42	0.96
Clothing and footwear	7.92	8.20	8.33	8.38	8.14	8.07	7.94	7.70	7.87	7.44
Consumer expendables	4.58	4.25	4.10	4.13	3.95	3.79	3.67	3.59	3.52	3.10
Housing	2.51	5.50	7.88	7.64	10.06	10.55	12.35	13.76	15.47	20.29
Transport	2.33	2.53	2.77	2.82	2.84	2.96	3.09	3.01	3.26	3.58
Durables	-1.01	1.70	2.83	4.05	4.95	5.94	6.85	8.00	9.82	13.22
Education and health	2.22	3.16	3.31	4.12	4.05	4.89	5.17	5.45	6.53	7.71
Personal services and entertainment	1.65	1.99	2.33	2.12	2.39	2.40	2.36	2.39	2.63	2.89
Social obligations	12.41	14.73	16.45	17.12	18.06	19.53	20.94	20.82	23.18	27.89
Locational group										
Food										
Home produced	22.47	18.36	15.44	15.54	13.52	12.54	10.22	9.71	5.34	-1.17
Locally produced	21.40	19.47	18.11	16.99	16.05	15.07	14.29	13.55	12.75	9.88
Imported	23.53	20.11	18.43	17.08	16.00	14.27	13.12	12.02	9.62	5.18
Nonfood										
Locally produced	17.87	23.50	27.70	28.74	32.06	34.21	37.36	38.91	43.06	52.79
Imported	14.74	18.56	20.31	21.64	22.37	23.90	25.01	25.82	29.23	33.32
Nontradables	23.72	28.64	32.42	33.35	36.30	38.12	41.07	42.47	46.18	54.92
Average farm size (acres) ^a	2.14	2.33	3.02	3.12	3.33	4.14	4.08	4.00	4.50	5.64
Average family size	7.07	6.64	6.42	5.90	5.45	5.43	5.27	4.66	4.65	3.89
Per capita expenditure (M\$)	150.00	197.00	225.00	255.00	289.00	327.00	369.00	419.00	514.00	820.00

^aFarm area is the operated paddy area.

NOTE: All household characteristic variables are evaluated at decile means.

SOURCE: Hazell and Roell (1983).

TABLE 35

MARGINAL BUDGET SHARES BY PER CAPITA EXPENDITURE
DECILE IN GUSAU, 1976/77
(in percents)

Group	Per Capita Expenditure Decile									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Commodity group										
Food, alcohol, and tobacco	77.88	76.74	76.75	76.89	76.45	76.26	76.18	75.78	76.15	75.89
Cereals and cereal products	50.99	44.40	42.07	39.89	37.86	35.40	34.56	31.49	30.45	26.48
Fruits, vegetables, and nuts	4.57	5.94	6.71	7.61	8.18	8.59	9.56	9.68	10.41	11.72
Meat and fish	7.22	9.44	11.44	11.03	11.32	11.44	12.70	12.72	12.80	13.58
Eggs and dairy products	7.32	8.50	7.57	8.77	9.28	10.73	8.35	11.00	11.39	12.28
Clothing and footwear	8.87	9.08	9.31	8.94	8.98	8.96	8.85	8.92	8.56	8.31
Consumer expendables	4.23	4.33	4.44	4.45	4.47	4.39	4.72	4.49	4.57	4.66
Housing	0.45	0.48	0.45	0.41	0.43	0.46	0.34	0.42	0.37	0.32
Transport	1.49	1.98	2.04	2.27	2.52	2.77	2.62	2.88	2.95	3.16
Durables	0.77	1.21	1.36	1.33	1.33	1.37	1.54	1.65	1.71	1.91
Education and health	1.41	1.57	1.57	1.53	1.57	1.59	1.57	1.64	1.64	1.68
Personal services and entertainment	1.34	1.21	1.09	1.08	1.04	0.99	1.13	1.07	0.99	1.00
Social obligations	3.57	3.39	2.99	3.09	3.20	3.22	3.06	3.15	3.06	3.06
Locational group										
Food										
Home produced	59.15	53.55	50.05	50.82	50.00	50.08	46.16	46.60	46.18	43.82
Locally produced	14.49	18.62	21.73	20.63	20.92	20.47	23.62	23.01	23.59	25.22
Imported	4.23	4.57	4.97	5.44	5.53	5.70	6.39	6.18	6.39	6.85
Nonfood										
Locally produced	10.95	11.05	10.56	10.73	11.02	11.21	10.93	11.24	10.94	10.96
Imported	11.17	12.21	12.69	12.38	12.53	12.53	12.90	12.98	12.91	13.14
Nontradables	26.96	29.22	27.61	29.29	30.49	32.06	30.11	33.09	33.75	35.51
Average farm size (acres) ^a	8.52	10.98	9.03	7.94	10.08	8.21	7.63	9.02	10.23	9.82
Average family size	12.52	10.48	7.66	7.31	7.66	7.69	5.62	6.24	5.45	4.61
Per capita expenditure (M\$)	42.00	62.00	73.00	84.00	96.00	107.00	120.00	140.00	163.00	221.00

^aFarm area is the operated paddy area.

NOTE: All household characteristic variables are evaluated at decile means.

SOURCE: Hazell and Roell (1983).

Gusau. There is a sharp drop in the share allocated to cereals and cereal products, but this is offset by increasing marginal budget shares for fruits, vegetables, and nuts; meat and fish; and eggs and dairy product. As in Muda, the marginal budget share for home-produced foods declines between the bottom and top expenditure deciles.

There is no significant change in the marginal budget shares for clothing and footwear or consumer expendables between expenditure deciles in either region. But in Muda the marginal budget shares for all other nonfoods increase significantly between the bottom and top expenditure deciles, especially for housing, durables, social obligations, and the aggregate of locally produced nonfoods and nontradables. These demand patterns are absent in Guasu, and there are no significant changes in the marginal budget shares for any nonfood category between per capita expenditures deciles. Only nontradables show any increase across the income deciles, and this is because of an increase in the nontradable foods consumed.

These results correlate strongly with the degree of access to market centers and urban areas in the two regions. Unlike Muda, which is densely populated and has an excellent transportation system, the villages in Gusau are typically much more removed from market centers and are faced with very limited means of transport. There may simply be little else to buy other than food without an arduous and time-consuming trip to the nearest town. Also, Hazell and Roell suggest that noncereal foods are considerable more expensive relative to cereals in Gusau than in Muda, and a larger share of the budget is required simply to enable the richer

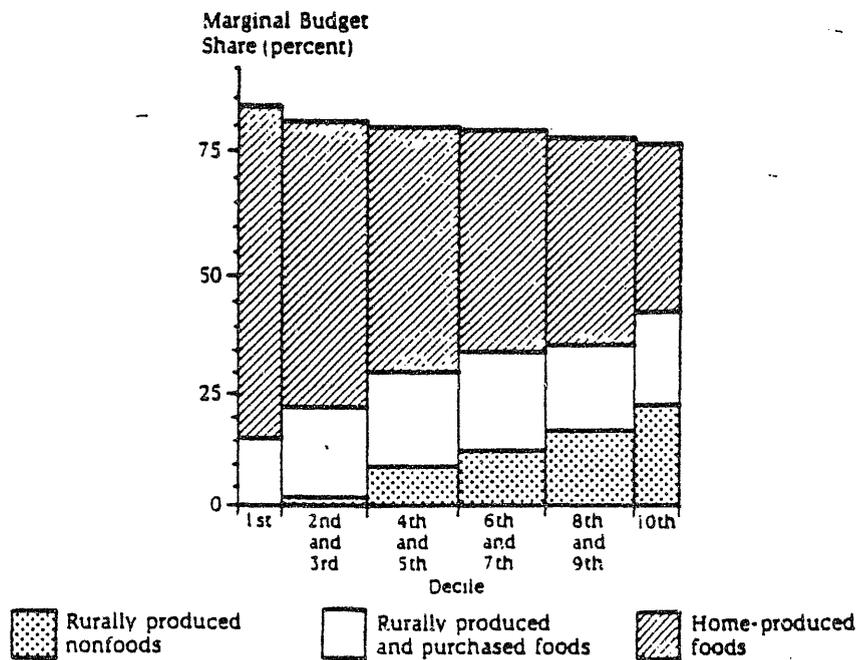
households to diversify their diets. For example, the relative price of beef to sorghum or millet is about 10:1 in Gusau. In contrast, the relative price of fish (the main beef substitute) to rice is only 5:1 in Muda.

King and Byerlee's study of rural household expenditure behavior in Sierra Leone provides a useful comparison to the Muda and Gusau results. Figure 10 summarizes their results on rural demand linkages by per capita expenditure decile. The size of the marginal budget share for rurally produced nonfoods is about the same in rural Sierra Leone as in Gusau--about 12 percent for the average household. However, unlike Gusau, this marginal budget share increases between the lower and upper expenditure deciles. But this encouraging Muda-like pattern is tempered by the observation that households in the first three-income deciles buy virtually no rurally produced nonfoods, and households in the top decile have a marginal budget share for rural nonfoods that is only half that of the average household in Muda. Access to rural nonfoods is clearly a problem, but the puzzle is why this is so much more pronounced for the poor.

Table 36 provides additional details on the marginal budget shares from the King and Byerlee study of rural Sierra Leone. Two results are of some importance. First, the marginal budget share for rural nonfood goods is much smaller than the marginal budget share for rural services and ceremonies in all income classes; less than one-tenth as large. This confirms that the consumption linkages for rural services are much

FIGURE 10

Marginal budget shares of locally produced goods and services, by per capita expenditure decile, Sierra Leone, 1974/75



Source: R. P. King and D. Bverlee, *Income Distribution, Consumption Patterns, and Consumption Linkages in Rural Sierra Leone*. African Rural Economy Paper 16 (East Lansing, Mich.: Michigan State University, 1977), Table 5.5

TABLE 36

MARGINAL PROPENSITIES TO CONSUME BY INCOME CLASS FOR
COMMODITIES IN SIERRA LEONE

Origin Classification	Marginal Propensity to Consume						
	Mean Expenditure Level	Income Class					
	Lowest Decile	Second and Third Deciles	Fourth and Fifth Deciles	Sixth and Seventh Deciles	Eighth and Ninth Deciles	Highest Decile	
Rural subsistence food	.445	.684	.588	.497	.436	.370	.286
Rural purchased food	.216	.153	.178	.201	.218	.235	.257
<u>All rural food</u>	.661	.837	.765	.698	.654	.605	.543
Rural nonfarm goods	.011	.013	.012	.011	.011	.010	.009
Rural services and ceremonial	.112	-.036	.023	.080	.117	.158	.211
<u>All rural products</u>	.784	.814	.801	.789	.782	.773	.763
<u>Rural town products^a</u>	.055	.034	.043	.051	.056	.062	.069
<u>Urban products^b</u>	.020	.019	.019	.020	.020	.021	.021
<u>Imported products</u>	.141	.133	.137	.140	.142	.144	.147
<u>Total</u>	1.000	1.000	1.000	1.000	1.000	1.000	1.000

^aRural towns are those between 2,000 and 100,000 in population. Byerlee and King call them "small urban" areas. Products include primarily transport, services and small industrial products.

^bUrban areas are all above 100,000 in population.

SOURCE: King, R.P. and D. Byerlee (1977).

stronger than those for rural manufacturing, as posited elsewhere in this paper.

Second, the marginal budget shares for products manufactured in small urban centers is about twice as large as the share for products manufactured in large urban areas. Given that most services are provided at the local level, this supports the hypothesis that the consumption linkages are spatially focused on rural market towns rather than on larger urban areas or dispersed rural settlements.

Income distribution also plays a potentially important role in determining the magnitude of consumption linkages. In situations where the marginal budget share for local nontradables differs by income group, the stimulatory effect of the consumption linkage on the local nonfarm economy will be affected by the way in which income is distributed. Based on the Muda results in Table 34, Hazell and Roell argued that the richer households, who also tend to have the larger farms, have the strongest demand links to the local economy, and hence the indirect benefits from agricultural growth will be larger if these households are the major beneficiaries of agricultural growth. They point out, however, that this conclusion might be tempered if a) the richer households had higher savings rates and their savings were not invested locally, b) the large farms were more mechanized and employed less labor per unit of land, or c) the region's export demand for foodgrains became inelastic. Similar conclusions are derived by Hazell and Ramasamy (1986) for North Arcot, though in this case the disparities in savings rates between small and

large farms are such as to neutralize the desirability of differences in expenditure behavior (Hazell, Ramasamy and Rajagopalan, 1987).

These kinds of distributional considerations seem less relevant for Africa given the pattern of expenditure behavior reported for Gusau in Table 35. Differences in the marginal budget share for nontradables across income deciles are sufficiently small that they might realistically be ignored. However, the Sierra Leone results in Figure 10 do suggest that income distributional considerations may become more important as village access to nonfoods becomes better.

6. A Caution

In several cases, available evidence has suggested that African farm-nonfarm linkages are lower than those found in Asia. Backward production linkages are expected to be lower because of an absence of irrigation inputs, lower levels of animal traction and lower population densities in Africa. Similarly, African marginal budget shares spent on nontradables average about 0.3, compared to the 0.4 measured in Muda. More alarming still, at the high end of the income distributions, they attain a maximum of 0.36 in Africa compared to 0.55 in Muda. Both average and highest decile marginal budget shares spent on nontradables appear to be over 30% higher in Asia than in Africa. Both lower African production and consumption linkages foreshadow estimates of lower growth multipliers.

But bear in mind that available measures may bias the African rural linkages estimates downward because of a key feature of the African rural economy - the high share of nonmarketed goods and services in total consumption. Because they are not marketed, many of these goods and

services are not measured. The Gusau consumption study, for example, does not impute a value for consumption of home produced nonfood commodities. And none of the studies values nontraded household services - cooking, cleaning, laundry and child care. Because the Asian economies are more highly monetized, more of these services enter the measured consumption accounts. Thus, in the same way GNP comparisons exaggerate income gaps between rich and poor countries - because high female workforce participation leads to booming restaurant, laundry, house cleaning and childcare businesses - the Asia-Africa comparisons are likely to overstate the apparent linkage gap between the two regions.

Consider too the farm household investment data in Table 37. These data make a rare attempt at valuing not only physical inputs but also fixed investment produced by family labor. The data, from Nigeria, reveal that over 80% of the value of investment comes in the form of land clearing and improvement, road construction, tree planting and construction - all primarily produced by family labor. In contrast, agricultural equipment accounts for only 7% of total assets. Even outside of cash cropping areas, farming systems researchers point to promising investments in soil fertility and drainage, for example through land leveling and tied ridging (Ohm, Nagy and Sawadogo, 1985; Eicher and Baker, 1982). So in the future, service and labor linkages may well prove to be the largest of the backward linkages supported by African agriculture. Today, because they are not procured with cash, many of these investments simply escape measurement. But in the future, as the rural Africa becomes increasingly monetized, both commodity and labor flows will become more visible. And the currently observed gaps between Asia and African linkages may well diminish.

TABLE 37

FARM HOUSEHOLD GROSS CAPITAL FORMATION,
ONDO STATE NIGERIA, 1981

	Value per Household (Naira)	Percent of Total
1. <u>Immobile Assets</u> ^a		
Trees and tree crop planting	1,650	57
Land clearing	412	14
Roads and road construction	222	8
Utility structures	125	4
2. <u>Equipment and supplies</u>		
Bicycles and autobikes	201	7
Agricultural machinery	118	4
Agricultural tools and implements	76	3
Stored produce	58	2
Biological input supplies	<u>31</u>	<u>1</u>
<u>Total Capital</u>	2,893	100

^aValued at imputed labor cost plus price of material inputs.

SOURCE: Adesimi (1983).

C. Probable Magnitude of the Agriculture to RNFE Multipliers

1. Direct Estimation

Data from Togo and Sierra Leone enable us to relate regional differences in rural nonfarm earnings to differences in agricultural income. These data, reproduced in Appendix Table A.2 and plotted in Figures 8 and 9, show a clear positive relationship between per capita agricultural income and per capita rural nonfarm earnings. That positive association squares well with our understanding of the changes taking place during structural transformation. It also reinforces the testimony from analysts who have observed higher levels of nonfarm activity attracted to prosperous agricultural regions, for example Berry (1975) in Nigeria and Freeman and Norcliffe (1985) in Kenya.

By regressing rural nonfarm income on agricultural earnings, we can generate crude initial estimates of the magnitude of agricultural growth linkages. At first blush, the estimated coefficient on agricultural income might be considered an upper bound projection of the agriculture-to-rural-nonfarm income multiplier; because some regional variation in nonfarm income may well be caused by forces independent of agriculture, for example government or resource based extraction and processing. For this reason, the regression estimates may be high side estimates of agricultural growth multipliers. But other factors, such as spillovers and leakages across regions, could lead to the opposite result, so it is not possible to say with certainty that the following estimates represent maxima.

Equations (1) and (2) display the results of two ordinary least square regressions of per capita nonfarm income (RNFY) on per capita farm earnings (AGY). The figures in parentheses are standard errors. Note that the Sierra Leone regression includes all regions except Scarcies, the outlier region with a high proportion of nonagriculturally related fishing income.

$$(1) \text{ Togo} \quad \text{RNFY} = 5.8 + .43\text{AGY} \quad R^2 = .56$$

(.22)

$$(2) \text{ Sierra Leone} \quad \text{RNFY} = 4.2 + .14\text{AGY} \quad R^2 = .31$$

(.09)

The Togo results indicate that a \$1 increase in agricultural income, other things equal, leads to a \$.43 increase in regional nonfarm earnings. This estimate is strikingly close to the modeling results that follow.

But the Sierra Leone estimate, even after removing the outlier region, is far lower. It suggests that a \$1 increase in farm income generates only an additional \$.14 in nonfarm earnings. Closer inspection of the survey methodology reveals the reason for this low figure. The Sierra Leone data exclude income from households primarily engaged in trading. Because commerce generates consistently the highest share in rural nonfarm income, the Sierra Leone data likely seriously underestimate total rural nonfarm earnings. For present purposes, one advantage of this omission is that it reduces the coverage of the nonfarm multiplier to principally production linkages. Supporting the notions advanced previously, this interpretation suggests that rural production linkages from agriculture

are in fact very low, at least in the predominantly hand hoe agriculture of Sierra Leone.

2. Modeling Agricultural Multipliers

In view of the limited opportunities for direct estimation of growth multipliers, much of what we can learn must come from modeling. The simple model used here is borrowed from Hazell (1984). It allows estimation of regional multipliers based on three basic parameters; two production and one consumption, values of which can be obtained from farm management, rural nonfarm enterprise and consumption surveys. The great advantage of modeling, of course, is that it allows us to explore the implications of alternative types of agricultural growth on the ensuing nonfarm linkages. Moreover, it also allows a breakdown of the total multiplier into its production and consumption based components.

a. The model

For most rural regions in developing countries, the major output is food or cash crops, the greater part of which is exported out of the region at given prices. In return, these regions import from outside the region manufactured goods for investment, production and household consumption. Locally produced nonfood goods and services are also produced in the towns and larger villages which cater almost exclusively to local demand. Local nontradable goods often include some specialty agricultural commodities, such as fresh fruits, vegetables, and livestock products. In fact, as we saw in our analysis of household expenditure behavior, the latter may be the dominant nontradables in rural Sub-Saharan Africa.

A reasonable characterization of the supply structure of many rural regions is as follows. The supply of their major output--foodgrains or export crops--is typically fixed by the technology and, in Asia by land, in Africa by labor. On the other hand, the output of nontradables is elastic. In Asia this is because the supply of labor, which is the major input for nontradables like services, is also elastic. In Sub-Saharan Africa the nontradables are mostly income elastic agricultural products which can be produced at the expense of major foodgrain or export crops. Other nontradables, particularly services, are often provided in the dry season when labor is relatively abundant.

If we further assume that the prices of all tradables (exports and imports) are given to the region, then we can construct a simple regional model to measure the multiplier effects.

Let X denote regional total gross output, which is comprised of tradable output T and nontradable output N . Then

$$(1) \quad X = T + N$$

We assume that the output of tradables is fixed

$$(2) \quad T = \bar{T}$$

However, the output of nontradables is elastic, and therefore output is determined by the regional demand for nontradables. This is comprised of household expenditure C_H on nontradables for consumption and investment purposes, and intermediate demands for nontradables C_p in regional production. We shall assume household expenditure can be approximated by a linear function of income

$$(3) \quad C_H = C_0 + \beta Y$$

where C_0 is a constant and β is the marginal budget share for nontradables out of income (value added) Y . We also assume that intermediate demands for nontradables are proportional to regional gross output X , so that

$$(4) \quad C_P = \alpha X$$

Here α is the ratio of nontradable intermediates to gross output. Regional demand for nontradables, which is equal to nontradable output, is then

$$(5) \quad N = C_H + C_P$$

Finally, total household income in the region, or regional value added is

$$(6) \quad Y = vX$$

Where v is the ratio of value added to gross output.

Substituting equations (2) through (5) into (1) yields

$$X = \bar{T} + C + (\alpha + \beta v)X, \text{ or}$$

$$(7) \quad X = (C + \bar{T}) / (1 - \alpha - \beta v)$$

Equation (7) determines the region's gross output given the output of tradables and key behavioral parameters of the regional economy.

Suppose now that the output of tradables is increased through technological change in agriculture. What will be the multiplier impact on the region's income or value added?

Using (6) and (7), the derivative

$$(8) \quad \frac{dY}{dT} = v / (1 - \alpha - \beta v)$$

measures the change in regional value added for a unit change in regional gross output. The value added multiplier is defined as the change in regional value added for a unit change in the value added from agriculture. To obtain this multiplier we need to divide (8) by the ratio of value added to gross output for agricultural tradables. Since, by assumption, this ratio is also v , the value added multiplier is

$$(9) \quad \frac{1}{v} \cdot \frac{dY}{dT} = 1/(1 - \alpha - \beta v)$$

In this model the value added multiplier happens to equal the gross output multiplier $dX/d\bar{T}$.

b. The size of the multiplier

The size of the value added multiplier is determined entirely by three key parameters in this simple model of a regional economy. These are the marginal budget share for nontradables in household expenditures (β), the ratio of nontradable intermediates to gross output in total production (α), and the ratio of value added to gross output in total production (v). If these three parameters are known, then we can calculate the size of the multiplier benefits deriving from agricultural growth in a rural region.

Since α , β and v are all ratios, they must take on values between 0 and 1. Furthermore, since $1-v$ is the ratio of total intermediates to gross output, then α cannot exceed $1-v$. In Table 38 we show the values of the regional value added multiplier for some selected values of α , β and v .

Other things being equal, the regional value added multiplier increases with the ratio of value added to gross output (v). Poorer regions tend to have higher values of v because they use less intermediates in production. However, this favorable component to the multiplier is likely to be offset in poor regions by a lower marginal budget share for nontradables (β); Table 38 shows that the multiplier declines with β . How the value of α might differ between regions is less clear. On the one hand, a higher ratio of value added to gross output should lead to a lower value of α . On the other hand, this may be offset by a greater reliance on nontradables as intermediates in poorer regions. By itself, larger values of α act to increase the value added multiplier.

The Muda region studies by Bell, Hazell and Slade (1982) is a moderately prosperous rice growing region in Malaysia. In 1973 the per capita income was US\$227. Using data from Bell, Hazell and Slade, we estimate the relevant parameters for Muda to be $v = 0.5$, $\beta = 0.4$ and $\alpha = 0.25$. Table 38 gives a multiplier of 1.818 for this combination of parameters. This is very close to the value added multiplier of 1.83 reported by Bell, Hazell and Slade after a much more careful analysis. Hazell, Ramasamy and Rajagopalan (forthcoming) have derived an identical multiplier for their North Arcot study region in south India using a similar modeling approach. In 1982-83 per capita income in north Arcot was US\$100.

While similar studies have yet to be undertaken in Sub-Saharan Africa, it is possible to provide rough orders of magnitude for the parameter values. The Gusau region of Northern Nigeria studied by Hazell

TABLE 38

VALUE OF THE REGIONAL VALUE-ADDED MULTIPLIER UNDER
DIFFERENT ASSUMPTIONS ABOUT KEY PARAMETERS
FOR A REGIONAL ECONOMY

<u>v</u>	<u>β</u>	<u>α</u>	<u>Value-Added Multiplier</u>		<u>Percent Multiplier Due to Consumption Linkages^a</u>
			<u>Consumption Endogenous</u>	<u>Consumption Exogenous</u>	
0.3	0.3	0.35	1.786	1.538	31.5
0.3	0.3	0.525	2.597	2.105	30.8
0.3	0.5	0.35	2.0	1.538	46.2
0.3	0.5	0.525	3.077	2.105	46.8
0.4	0.3	0.3	1.724	1.429	40.7
0.4	0.3	0.45	2.326	1.818	38.3
0.4	0.4	0.3	1.852	1.429	49.6
0.4	0.4	0.45	2.564	1.818	47.7
0.4	0.5	0.3	2.0	1.429	57.1
0.4	0.5	0.45	2.857	1.818	56.0
0.5	0.3	0.25	1.667	1.333	50.2
0.5	0.3	0.375	2.105	1.6	45.7
0.5	0.4	0.25	1.818	1.333	59.3
0.5	0.4	0.375	2.352	1.6	55.6
0.5	0.5	0.25	2.0	1.333	66.7
0.5	0.5	0.375	2.667	1.6	64.0
0.6	0.3	0.2	1.613	1.25	59.2
0.6	0.3	0.3	1.923	1.429	53.5
0.6	0.5	0.2	2.0	1.25	75.0
0.6	0.5	0.3	2.5	1.425	71.4
0.68	0.3	0.10	1.440	1.111	74.7
0.68	0.3	0.15	1.550	1.176	68.0
0.85	0.3	0.05	1.439	1.052	89.0
0.85	0.3	0.10	1.550	1.111	81.1

^aCalculated as $(M_c - M)/(M_c - 1) \times 100\%$ where M_c and M are the multipliers calculated with consumption specified endogenously at exogenously, respectively.

and Roell (1983) is much poorer than Muda and North Arcot. In 1976 the region's per capita income was about half of that in Muda in 1973. Hazell and Roell give an estimated value for β of about 0.3. A similar value of β can be obtained for rural Sierra Leone using the data provided by King and Byerlee.

The value added to gross output ratio (v) tends to be high in African agriculture--about 0.9 to 0.95--because few modern inputs are used (See Appendix Table A.4). Careful studies of a range of rural nonagricultural activities in Botswana (Haggblade 1982, Section B. and Haggblade 1984, p. 315) and Sierra Leone (Liedholm and Chuta 1985) suggest an average v value of about 0.6 (See Appendix Table A.5). Assuming that about 70% of rural value added derives from agriculture, then the average value of v lies in the range 0.82 to 0.86--say 0.85. Since α must be less than or equal to $1-v = 0.15$, we shall assume α values in the range 0.05 to 0.1.

Given these parameter values for rural regions in Sub-Saharan Africa, the multiplier would be about 1.5 (Table 38). When compared to the multiplier of 1.83 reported for the two Asian case studies, the indirect gains in nontradable value added are only 60% as large in Sub-Saharan Africa.

These indicative multiplier depend critically on the assumption of a highly elastic supply of nontradables. If this supply is less elastic, perhaps because of labor shortages in Sub-Saharan Africa, then the multiplier will necessarily be smaller.

c. Estates verses smallholders and the size of the multiplier

It might be expected that the multiplier will be affected by the

relative importance of commercial farmers (estates) and smallholders in producing total agricultural output. Available data on cash crops grown by estates suggests v values in the range of 0.65 to 0.75 (Appendix Table A.4). In contrast, smallholders have v values of around 0.8 to 0.9 for cash crops and 0.9 to 0.95 for food crops. Estates also use modern inputs more intensively than smallholders, so it seems unlikely that their α values are much larger than those for smallholders despite their lower values of v . If, in the absence of better information, we also assume similar values of β for estate families and smallholders (large farmers had only marginally higher values of β in Gusau), then regions dominated by estates will necessarily have smaller multipliers. Our model can be used to predict how much smaller the multiplier will be.

Let us compare two regions, both of which derive 70% of their total value added from agriculture but one is dominated by estates and the other by smallholders. As before, assume a v value of 0.6 for nonagriculture and an average β of 0.3. In the estate dominated region the v value for agriculture will be about 0.7, giving an average v value for the regional economy of 0.68. Then, given values of α in the range of 0.1 to 0.15, the multiplier will lie between 1.44 and 1.55 (Table 38). In the smallholder dominated region the v value for agriculture will be closer to 0.9, hence the average v for the region will be about 0.85. The value of α is then likely to fall in the range of 0.05 to 0.1, giving a regional multiplier of between 1.45 to 1.55. This happens to be the same as the multiplier for the estate dominated region suggesting that the relative importance of

smallholders and estates within a regional economy has little bearing on the size of the multiplier.

A more significant difference would emerge if the β values also differed. For example, if estate families were found to have more urbanized expenditure patterns and their β value were only 0.2, then the estate dominated region ($v=0.68$, $\beta = 0.1$) would have a multiplier of only 1.31.

d. The relative importance of consumption and inter-industry linkages in the multiplier

We can also use our model to isolate the importance of the household consumption linkages relative to the inter-industry linkages in the multiplier. To do this we need a variant of the model in which household consumption is held constant. The derived multiplier arising from agricultural growth will then be due entirely to inter-industry linkages.

Replace equation (3) with

$$(3)' \quad C_H = C_0$$

where C_0 is a constant. Regional gross output X becomes

$$(7)' \quad X = (C + \bar{T}) / (1 - \alpha).$$

Calculating the value added multiplier as before, this is now

$$(9)' \quad \frac{1}{v} \cdot \frac{dY}{d\bar{T}} = 1 / (1 - \alpha)$$

Thus, when household consumption expenditure is held constant, the value of the regional multiplier is determined solely by α ; the ratio of nontradable intermediates to gross output in total production.

The values of the multiplier obtained from (9)' for selected values of α are also reported in Table 38, where they can be compared with the full multiplier corresponding to endogenous consumption behavior. The difference between each matching pair of multipliers is the component of the full multiplier attributable to the consumption linkages. For example, in the first row of Table 38, the full multiplier leads to an indirect gain in regional income of US\$0.786 for each US\$1.0 increase in value added in agriculture. But when household consumption is held constant, the indirect gain is only US\$0.538. The difference, US\$0.786 - US\$0.538 = US\$0.248, is therefore the indirect gain attributable to the household consumption linkages. This is equal to 31.5% of the total indirect gain.

The share of the multiplier attributable to the consumption linkages increases with β and v , but declines as α increases. For the Muda region with parameter values $v = 0.5$, $\beta = 0.4$ and $\alpha = 0.25$, 59.3% of the multiplier is attributable to the consumption linkages (this compares almost exactly with Bell, Hazell and Slade's estimate--page 179). Hazell, Ramasamy and Rajagopalan report that half of the multiplier in North Arcot was due to household consumption linkages.

In contrast, the consumption linkages become relatively much more important in regions having the kinds of parameter values we previously associated with Sub-Saharan Africa. For example, with $v = 0.85$, $\beta = 0.3$ and $\alpha = 0.1$, the consumption linkages account for 81% of the multiplier. This is not because the consumption linkages are more powerful in Africa than Asia (we have assumed a smaller value of β for Africa). Rather, it

reflects the much weaker inter-industry linkages associated with high values of v and low values of α . This reiterates the conclusions drawn from the Togo and Sierra Leone direct multiplier comparisons above.

3. Macroeconomic Consequences and Simulations

The foregoing analysis presumes that regional growth is an end in itself, and it gives no regard to spillover effects that might be induced elsewhere in the national economy. For example, imports into a rural region are leakages as far as regional growth is concerned. But if these goods are produced in other rural areas, or if they create jobs for the urban poor, they will still be desirable from the national viewpoint. Similarly, savings that are invested outside the region represent a loss to regional growth, but they are nevertheless valuable in furthering national economic growth.

To measure the full indirect impact of agricultural growth in the national economy requires a more general equilibrium modeling approach. Byerlee has undertaken such work for Nigeria (Byerlee, 1973) and Sierra Leone (Byerlee, et.al., 1977). Using a macroeconomic simulation model, he analyses the impact of government policies for expanding, alternatively, the production of export and food crops. For Nigeria, his results show that policies which expand food crop production increase value added in nonagriculture by Naira 0.23 for each Naira 1.00 increase in value added in agriculture. In contrast, policies to increase export crop production lead to between 0.73 and 0.96 Naira of additional value added in nonagriculture for each Naira 1.00 increase in agricultural value added.

The results for Sierra Leone are more modest, probably reflecting the much weaker industrial base of that country. Increases in food crop production have a similar impact on the national economy as in Nigeria: Leone 0.29 of nonagricultural value added for each Leone 1.00 of additional value added in agriculture. But the linkages emanating from increased export crop production are weaker than in Nigeria - Leone 0.42 of value added in nonagriculture for each Leone 1.00 of additional value added in agriculture.

These results are generally consistent with the size of our regional multipliers. This would seem to suggest that any positive spillover effects arising beyond a region's boundaries are largely offset by negative spillover effects, arising perhaps from reduced labor and capital outflows from a growing region.

There are no directly comparable studies for Asia, but modeling studies of India (Rangarajan, 1982) and South Korea (Adelman, 1984) suggest much stronger linkage effects from agricultural growth on the national economy.

IV. CONSTRAINTS TO THE GROWTH OF RURAL NONFARM ENTERPRISES

A. Demand

The power of agricultural growth linkages depends heavily on whether or not demand currently constrains the output of rural nonfarm enterprises. If indeed demand constraints prevail, second round responses to agriculturally induced growth occur at very low or no opportunity cost, and multipliers attain their full value.

Demand for the goods and services of rural nonfarm enterprises (RNFE) depends heavily on the purchasing power of the surrounding farm population. Agriculture generates about 70% of rural income in many African countries (Table 3), thus providing a principal source of rural spending power. Because fiscal, tariff and pricing policies all critically affect farm incentives and farm income, the sum total of these policies affecting the terms of trade between agriculture and the rest of the economy government policy is a crucial determinant of effective demand for rural nonfarm products. A host of analysts have described the array of policies affecting African agriculture and in general conclude that agriculture has been heavily taxed relative to urban and manufacturing sectors. African governments, for example, typically tax export crops, at rates between 30 and 50% (World Bank, 1981). Sharpley's (1981) estimate for Kenya indicates that government has increasingly taxed agricultural income, reducing farmer purchasing power by substantial amounts. Thus, if demand does constrain RNFE, government agricultural policy must bear major responsibility.

To argue that demand constrains rural nonfarm employment requires evidence of excess capacity in nonfarm activities. While capacity utilization is difficult to measure in rural areas where seasonality and lack of electrical illumination prevent multiple shifts, two African studies have ventured estimates of excess capacity in nonfarm enterprises. Based on entrepreneurs' judgements about how much output could be increased in the face of unlimited demand and material availability, Liedholm and Chuta (1976) estimate that rural nonfarm enterprises operate with 25 to 45 percent excess capacity. As Table 39 indicates, excess capacity of this magnitude appears in all major rural nonfarm manufacturing and repair enterprises, although surplus capacity seems greater in smaller rural localities. Steel's (1977) estimates for Ghana find excess capacity in the range of 34 to about 60 percent for three towns, two of which can be classified as rural towns. He, too, finds some variation by activity, although he offers no disaggregation by size of locality. Because they refer to slack in only single shift operations, these figures are likely to be lower bound estimates of excess capacity.

This considerable excess capacity is consistent with the notion that rural nonfarm activity is demand constrained. Of course, since excess capacity may also stem from supply side bottlenecks, it constitutes a necessary but not a sufficient condition for judging RNFE demand constrained. Since tailors and service enterprises, the most numerous of the RNFE, require customers to supply working materials, it seems likely that a substantial portion of the excess capacity is in fact caused by limited demand. Consequently, demand likely does constrain RNFE output,

TABLE 39
 EXCESS CAPACITY IN AFRICAN RURAL NONFARM ENTERPRISES
 (percent)

<u>Sierra Leone (1974)</u> <u>(Locality size)</u>	<u>Tailoring</u>	<u>Carpentry</u>	<u>Blacksmith/ Metalwork</u>	<u>Baking/ Milling</u>	<u>Aggregate</u>
Under 2,000	45	45	43	--	--
2,000 - 20,000	34	33	47	41	--
20,000 - 100,00	29	25	30	32	--
Over 100,000	24	22	--	30	--
Overall	33	34	41	34	35
<u>Ghana, 1974^a</u>	34	58	41	52	51

^aThree urban areas, Accra (population 25,618) and Aburi (population 7,656).

SOURCE: Sierra Leone: Liedholm & Chuta (1976).
 Ghana: Steel (1977).

and agriculturally driven linkage multipliers can, therefore, be expected fully in the 1.5 range predicted by the modeling evidence above.

B. Supply Constraints

Entrepreneurs, when asked what principal problems constrain their activity, invariably emphasize the supply side.- Capital shortages - expressed either as needs for cash, operating funds, liquidity, credit, or concern with the high price of material inputs - almost always emerges as their principal preoccupation. Table 40 documents this concern for a wide array of rural and urban small enterprises in Africa. Studies in other geographic regions echo the same refrain.

But prominent analysts of rural and small-scale nonfarm enterprises doubt that working capital is as big a constraint as entrepreneurs contend (See Harper, 1977 & 1984; Kilby, 1962, 1982; Chuta and Liedholm 1979; Liedholm and Mead 1987). A variety of management inefficiencies may result in cash flow difficulties, making working capital constraints at least partially a symptom rather than a cause of operational business difficulties. So too may poor transport facilities and irregular input supply or output marketing networks surface as cash flow problems. While entrepreneur perceptions of cash flow difficulties very likely exaggerate their absolute importance, the rudimentary nature of transport, communication and institutional infrastructure does undoubtedly diminish the efficiency with which nascent rural financial markets operate. Hence credit cannot be dismissed as a supply side concern. The practical issue then becomes whether working capital shortages should be addressed by

TABLE 40

PRINCIPAL BUSINESS PROBLEMS AS ASSESSED BY NONFARM ENTREPRENEURS
(percent of entrepreneurs citing specific problems)

	<u>Capital</u>	<u>Customers</u>	<u>Raw Materials</u>	<u>Infrastructure</u>	<u>Transport Prices</u>	<u>Other</u>
1. Rural Enterprises						
Ghana, Rural Towns (1984)	61	3	5	--	--	31
Kenya, Bungoma District	48	0	28	72	22	--
Central Province	77	35	20	--	--	--
Meru District	84	7	58	40	28	--
RIDC Clients (1972)	68	0	75	--	84	--
Zambia, Six Provinces (1985)	--	--	53	--	--	--
2. Urban Small Enterprises						
Accra, Ghana	42	18	36	--	--	--
Bamako, Mali	35 ^a	36	a	--	--	--
Djibouti	57 ^a	11	a	--	--	--
Kigali, Rwanda	67 ^a	21	a	--	--	--
Lome, Togo	22 ^a	52	a	--	--	--
Nairobi, Kenya	29	39	13	1	--	--
Nouakchott, Mauritania	45 ^a	36	a	--	--	--
Yaounde, Cameroon	49 ^a	24	a	--	--	--

^aIncludes lack of funds, cost of equipment and raw materials.

SOURCE: Ghana: Yankton (1985); Kenya, Meru and Bungoma Districts: Williams and McClintock (1981); Kenya, Central Province: Freeman and Norcliffe (1985); Kenya, RIDC: Child (1977); Zambia: Milimo and Fisseha (1985); Accra: Steel (1977); Nairobi: House (1978), cited in Livingstone (1986); Bamako, Djibouti, Kigali, Lome, Nouakchott, Yaounde: ILO (1985x).

treating the symptom, through direct lending, or the ultimate cause of the cash flow difficulty by providing management assistance, infrastructure and institutional development, or some combination of all these strategies. The answer depends on the cost effectiveness of the alternatives, an issues that will be dealt with presently.

Raw material shortages, possibly related to working capital problems but also likely the result of poor road and transportation networks, also emerge as a common concern of rural nonfarm entrepreneurs. As one would expect, Table 40 indicates that this concern is far more prevalent in rural than in urban areas. Concerns with infrastructure and transport prices, both closely related to the raw material problems, also surface with some regularity.

Entrepreneurs rarely identify management or technical deficiencies as constraining their operations. But, here too, the outside analysts and seasoned practitioners concur that there exists room for improvement on both scores in many small enterprises. Malcolm Harper, in particular, maintains that management consulting, on a very basic level, can generate significant increases in the profitability of rural nonfarm enterprises (Harper, 1977 & 1984; Harper and Soon, 1979).

C. Existing Policy and Programs

A welter of institutions and individuals have worked to influence the productivity and profitability rural nonfarm enterprises by addressing one or more of the major RNFE constraints. They have operated on two basic levels, working with both policies and projects.

1. Policies

African governments maintain a wide array of policies that affect the operation of rural enterprises. These policies operate primarily through their differential impact on large and small firms; because most - although not all - rural firms are small. Investment codes, tariff, tax, and labor laws are of primary importance in shaping the environment within which rural firms compete with urban and foreign competitors.

Virtually all African countries have adopted investment codes primarily to encourage investment in manufacturing. They provide an array of tax and tariff advantages as well, sometimes, as government guarantees of infrastructure provision to encourage the establishment of domestic manufacturing. A recent review of investment codes in Francophone West Africa indicates that common provisions include corporate income tax holidays ranging from 3 to 25 years, duty exemption on imports of equipment and raw materials for up to 15 years, as well as a variety of other country-specific incentives (Haggblade, 1984). All benefits are scaled up so larger capital investments receive higher incentives. In fact, most investment codes apply only to firms requiring above a certain threshold of investment. In Burkina, for example, only firms with fixed investment of over \$63,000 qualify for major investment code advantages. While Botswana's code (their Financial Assistance Policy) remains a major exception, most other African investment codes effectively exclude the great majority of small rural and urban firms from consideration.

The only explicit recognition of urban-rural differences embodied in these codes frequently lies in the provision of slightly higher levels of

preferences for businesses established outside of the capital or major cities. Sometimes these incentives are accompanied by provision of subsidized infrastructure in the form of serviced industrial land or industrial estates. But these efforts rarely succeed in enticing large firms out of the major cities (UNIDO, 1978).

Investment codes and the related policy environment almost invariably favors the large, and hence the urban, enterprise; and they frequently do so by reducing the price of capital faced by these large firms. Drawn up with the large firms in mind, regulations exempt big manufacturers from import duty on all equipment, while small rural tailors, metal workers, transporters and service establishments face duties on their sewing machines, hand tools, welding equipment, and vehicles. Evidence from Nigeria, Sierra Leone, and Burkina suggests that for common small enterprise activities, the duty rates faced frequently lie in the range of 30-50% raising their equipment costs by that amount and placing them at a competitive disadvantage compared to the large firms (Chuta and Sethuraman, 1984; Liedholm and Chuta, 1976; Haggblade, 1984). Foreign exchange guarantees and access to credit at artificially low rates of interest further accentuate the capital subsidies. Labor laws work in the other direction, raising up labor costs to large firms and providing small firms some measure of labor cost advantage. Because large firms ultimately do pay taxes after tax holidays have expired, tax laws, too, confer a cost advantage on small firms which more easily elude the fiscal net.

The net effect of policy induced factor price distortions has been measured for several African and Asian countries. The results, displayed in Table 41, indicate that the common impact of the array of promotional policies is to underprice capital and overprice labor for large firms, and vice versa for the small. Thus, they encourage more capital intensity in large firms and more labor using technology in small firms than would prevail in a neutral environment.

The net effect of policies on the competitiveness of small vis-a-vis large firms is difficult to sort out. But in Sierra Leone, the one instance where data exist in sufficient detail to make an assessment, it is clear that the net impact of government policies has been to subsidize large scale enterprises and to penalize the small (Haggblade, Liedholm and Méad, 1986). Moreover, in this case, the large firms produce at negative social profitability, supported only by the extensive array of policy induced subsidies.

2. Programs

a. Program profiles

African governments, often aided by donors and Private Voluntary Organizations (PVOs), have instituted a wide array of programs on behalf of rural, and even more commonly, on behalf of small enterprises. Common program components include credit, serviced industrial land and workshop buildings, assistance in project preparation, management and technical assistance. In some cases programs provided an integrated package of credit, project preparation, management and technical assistance. This integrated, package approach was particularly evident during the wave of

TABLE 41

THE DIFFERENTIAL IMPACT OF POLICY-INDUCED FACTOR PRICE DISTORTIONS
ON LARGE AND SMALL NON-AGRICULTURAL ENTERPRISES: PERCENT DIFFERENCE
IN LARGE FIRMS' COST RELATIVE TO SMALL FIRMS

Country	Period	Percent Difference in Labor Costs	Percent Difference in Capital Cost Owing to: ^a				Percent Difference in Wage/Capital Rental Rate
			Trade Regime	Interest Rate	Taxes	Total Capital	
<u>Asia</u>							
Hong Kong	1973	0	0	0	0	0	0
Pakistan	1961-64	0	-38	-44	+22	-60	+150
South Korea	1973	0	-5	-35	+10	-30	+43
<u>Africa</u>							
Ghana	1972	+25	-25	-42	+26	-41	+119
Sierra Leone	1976	+20	-25	-60	+20 ^b	-65	+243
Tunisia	1972	+20	-30	-33	n.a. ^b	n.a.	n.a.
<u>Latin America</u>							
Brazil	1968	+27	0	-33	n.a.	n.a.	n.a.

^aAll capital-related figures have been converted into the annual rental value of a unit of capital (or user costs) using a modification of capital recovery formula presented in Guisinger (1981, p. 329).

^bn.a. = data not available.

SOURCE: Haggblade, Liedholm, and Mead (1986).

industrial estate programs launched in the 1960's and early 1970's. Imported from India to Kenya in 1966, the initial urban industrial estate program (KIE, the Kenya Industrial Estate Programme) was expanded to rural areas in the form of Rural Industrial Development Centers (RIDCs). From Kenya, often with Scandinavian and UNIDO funding, the industrial estates spread to Tanzania, Swaziland, Lesotho, Botswana, Burkina and beyond.

In addition to the highly integrated package of promotional services available in the nursery industrial estates, many agencies have implemented programs tailored to address one or more of the principal nonfarm enterprise constraints. Credit programs have clearly been the most numerous; on the order of 90% of all donor-financed small enterprise projects include a finance component (Devres, 1981). Implemented by a variety of governments, development banks, PVOs and church groups, these programs most often provide credit for equipment rather than raw materials and frequently at concessional interest rates. Donors have strongly supported the small enterprise credit schemes. The World Bank, between 1977 and 1985, has directed approximately 30% of its industrial lending through intermediaries to small enterprises; although, as in many such programs, "small" loans have remained fairly large - in the range of \$20,000 to \$50,000 - and primarily urban (Levitsky, 1985). But PVOs and church groups operate a welter of very small scale and often rural loan funds.

Governments and PVOs have also initiated management and technical training. A number of countries have established vocational training institutes expressly to improve technical skills of potential nonfarm

entrepreneurs. Rural artisan, especially rural blacksmith programs, have been a popular variant of this genre, springing up in Botswana, Burkina, Rwanda, Tanzania and undoubtedly elsewhere as well. Several PVOs, notably VITA and Care, provide technical extension in areas such as mud oven bakeries, charcoal production, beekeeping, and wood and metal working.

Management training and extension has been most strongly advocated by Malcolm Harper (1979, 1984) whose methods of barefoot management extension have been adopted by the Partnership for Productivity (PFP) in Kenya, Botswana, Malawi and Burkina. Technoserve, another PVO with wide experience in management extension, often engages in long-term management contracts with individual firms.

Another variant of management training is centered on assistance with pre-project feasibility studies. Commonly funded by UNIDO, these services are provided in the great majority of African Ministries of Industry or their promotional arms.

Finally, many countries have begun decentralizing industrial infrastructure by creating serviced industrial and commercial zones in regional towns in an effort to encourage decentralization of business activity. These projects, almost always donor funded, typically involve zoning, surveying, and installation of basic road, electrical, communication and water infrastructure to a designated area.

Given the large array of institutions involved - governments, PVOs, trade associations, church groups and donors - it is not possible to maintain an up-to-date inventory of all promotional activities currently underway on behalf of African rural nonfarm enterprises. Nonetheless,

Table 42 attempts to identify the government promotional programs operating in a cross section of African countries. Some programs - as in Nigeria, Kenya, and Botswana - are explicitly rural, while others focus on small firms and therefore may partially spill their operations over into rural as well as urban areas.

Several common propensities are evident in the current array of assistance programs. First, most effort and money goes to the provision of credit. And in a majority of cases, agencies limit lending to investment rather than working capital. In part this penchant for fixed capital lending stems from the bankers' desire for seizable collateral; in part it reflects a desire to directly expand business activity. Given the apparent excess capacity in many rural nonfarm enterprises and given the expressly stated need for working capital, this bias is unfortunate.

Second, most assistance programs focus on manufacturing. Although there are some notable exceptions, many programs preclude services and commercial enterprises from participating as project beneficiaries. This proclivity stems largely from the notion that sectors other than manufacturing are "unproductive". Commerce, in particular, suffers from the image many people have of small children and women purchasing single packs of cigarettes, matches or bunches of bananas and reselling them one by one. Perhaps it is the traders' misfortune that these representatives of their craft are the ones most visible from the windows of consultants' hotels. But even in these cases, the mini traders perform useful services for which people are willing to pay. They buy in quantities larger than many consumers can afford and sell individual items. They save consumers

TABLE 42

SUMMARY OF RURAL AND SMALL NONFARM ENTERPRISE PROMOTION PROGRAMS
IN SUBSAHARAN AFRICA

	<u>Small Ent. Promotion Agencies</u>	<u>Nursery Estates</u>	<u>SSE Credit</u>	<u>Extension Services</u>	<u>Feasibility Studies</u>	<u>Technical Training</u>
Botswana	BEDU-U/R RIOs-R BAS-U/R	Yes	Natl. Dev.Bk.	TA,MA-U/R	Yes	Yes
Burkina	OPEV-U Ch.Comm. Artisanat-U/R	Yes	Natl. Dev.Bk.	No	No	Yes
Burundi	No	No	No	No	Yes	--
Cameroon	CNAPME	No	Yes Com.Bk.	--	--	--
Ethopia	HASIDA-U	No	Ag.Bank	MA,TA-U/R (for coops)	--	--
Ghana	GEDC-U	No	GEDC	No	--	--
Kenya	KIE-U RIDC-R	Yes Yes	KIE-U RIDC-R	TA,MA-U TA,MA-R	Yes	--
Lesotho	LEDU	Yes	Yes	--	--	--
Liberia	--	--	LDC-U LBIDI NIC	--	--	--
Madagascar						
Nigeria	IDCs-U/R VICs-U/R	Yes-U	SIC-R/U	MA,TA (IDCs)	--	VIC
Rwanda	--	No	Dev.Bk.-U/R Bk.Pop.-R	MKA-R	Yes	Yes
Senegal	--	--	--	--	Yes	--
Swaziland	SEDCO-U	Yes	SEDCO?	MA,TA-U	--	--
Tanzania	SEDO-U/R	Yes?	--	--	--	--

Table 42 (CONT.)

Abbreviations: General: U=urban, R=rural, TA=technical assistance, MA=management assistance, Com.Bk.=commercial banks.

Botswana: BEDU=Botswana Enterprises Development Unit, RIOs=Rural Industrial Officers, BAS=Business Advisory Service.

Burkina: OPEV=Organization pour la Promotion de l'Entreprise Voltaïque, Ch.Comm.=Chambre de Commerce, de l'Industries et de l'Artisanat.

Cameroon: CNAPME=Centre National d'Assistance aux Petites et Moyennes Entreprises.

Ethiopia: HASIDA=

Ghana: GEDC=Ghana Enterprises Development Commission.

Kenya: KIE=Kenya Industrial Estates, RIDC=Rural Industry Development Centres.

Lesotho: LEDU=Lesotho Enterprise Development Unit.

Liberia: LDC=Liberian Development Commission?, LBIDI=Liberian Bank for Industrial Development and Investment, NIC=National Investment Commission.

Madagascar:

Nigeria: IDC=Industrial Development Centers, VIC=Vocational Improvement Centers.

Rwanda: Dev.Bk.=Banque Rwandaise de Developpement, Bk.Pop.=Banques Populaires.

Senegal: SONAPI=Societe Nationale pour la Promotion de l'Investissement?

Swaziland: SEDCO=Swaziland Enterprise Development Corp.

Tanzania: SEDO=Small Enterprise Development Organization.

SOURCE: ILO (1983b-h,j; 1984, 1985b,c); Steel (1979); Chuta and Sethuraman (1984), Kilby (1984), Kilby (1982, 1987), Hunter (1979), Livingstone (1977), and personal visits.

time and transport costs in congested cities. They save society resources and improve consumer welfare. Trade and services produce value added just as surely as manufacturing does. And the argument that manufacturing generates backward linkages not present in other sectors ignores the crucially important forward linkages and market opportunities that can be opened up by trading and distribution. Given that all available empirical evidence - the cross section, time series and consumption data - project that the strongest rural nonfarm growth will come in services and in commerce, the common manufacturing-only stance seems destined to divert resources from activities with the highest growth potential.

b. Program evaluations

Over the past 5 to 10 years, a small but growing body of careful ex-post project evaluations has emerged shedding important light on the effectiveness of alternative forms of small and rural enterprise promotion. Many are Africa specific, for example, Goldmark, Rosengard and Mooney (1978); Lassen, Traore, Brown and Walton (1985), Haggblade (1982), Kilby (1982 and 1987), Hunter (1980), and Livingstone (1977). But many more come from other geographic regions. Particularly important are the recent comparative studies by Blayney and Otero (1985), Farbman (1981), Ashe (1985), Kilby (1979), Kilby and Bangasser (1978), Kilby and d'Zmura (1985), Levitsky (1985), and Liedholm (1985). While the evaluation experience is not exclusively drawn from rural Africa, a number of lessons emerge with sufficient consistency that they lend confidence to those wishing to direct African efforts based on the collective wisdom of world-wide findings.

Liedholm and Mead (1987) provide the most succinct recent distillation of the findings of the small enterprise project evaluation literature. A first, and perhaps surprising finding, is that a significant share of the small and rural enterprise promotion schemes evaluated have generated not only positive but high B/C ratios and internal rates of return. Of course the sample of evaluations available in the literature may be biased in an optimistic direction given that agencies implementing costly failures rarely hire outside evaluators and even less frequently propagate unflattering reviews. Certainly the series of evaluations from Botswana shows a mixed record. Including reviews of four technical assistance projects and three infrastructure provision efforts, two had B/C ratios of 0, three were less than one, and only two exceeded one (Haggblade, 1982). Kilby and Bassanger's (1978) review of ten ILO technical assistance projects found six of ten has B/C ratios below one.

But aside from these two sources, the bulk of the reviews conclude that small and rural enterprise promotion has frequently been cost effective. Kilby and d'Zmura's (1985) review of seven PVO small enterprise credit schemes computed B/C ratios between 1.02 and 8, leading them to conclude that "These rates of return place microenterprise lending schemes among the most successful categories of all types of foreign aid programs." Likewise, Levitsky (1985) suggests that World Bank small enterprise lending has fared as well standard lending programs. Blayney and Otero (1985) conclude, on a similarly optimistic note, that "small and micro-enterprise projects can accomplish ... (income and employment creation) objectives effectively."

This evidence suggests several hypotheses about the relative effectiveness of different categories of intervention. First, credit projects seem to generate the highest B/C ratios, while technical assistance projects have a very mixed record. And the infrastructure projects evaluated in Botswana all fared poorly, with B/C ratios below .4. Finally, we are not aware of any careful B/C evaluation of management assistance efforts. While it may indeed be possible to raise rural nonfarm income by improving management skills, we have no evidence on whether it can be done cost effectively.

Liedholm and Mead (1987), in addition, draw several important operational lessons from the array of currently available evidence. For credit projects, they suggest that working capital lending appears more successful than those projects lending for fixed capital investment, probably because they respond to the more important credit need of the small firms. In addition, working capital loans flow necessarily to existing businesses; and the evidence points very clearly to higher success rates among projects working with existing firms as opposed to those attempting to suscite new enterprises. Because existing firms have proven markets, access to raw materials, labor and production facilities already, working capital credit provides them with a "single missing link" that enables them to increase production and profit. Liedholm and Mead echo the conclusions of Kilby (1979) and Kilby and d'Zmura (1985), that those projects that focus on single missing ingredients have a far better chance of success than those that try to provide everything - credit, marketing, management, and technical

assistance - at once. The dismal record of the industrial estate programs underlines the simplicity and power of this notion, that interventions will be most viable if they can identify opportunities in which provision of a single missing component will enable a multitude of nonfarm enterprises to grow. Boomgard et al. (1986) have proposed a diagnostic research technique, the subsector approach, that aims to identify key missing links for important or potentially important nonfarm employers. Box 3, below, illustrates how a subsector study can be used to identify high payoff interventions on behalf of small rural enterprises.

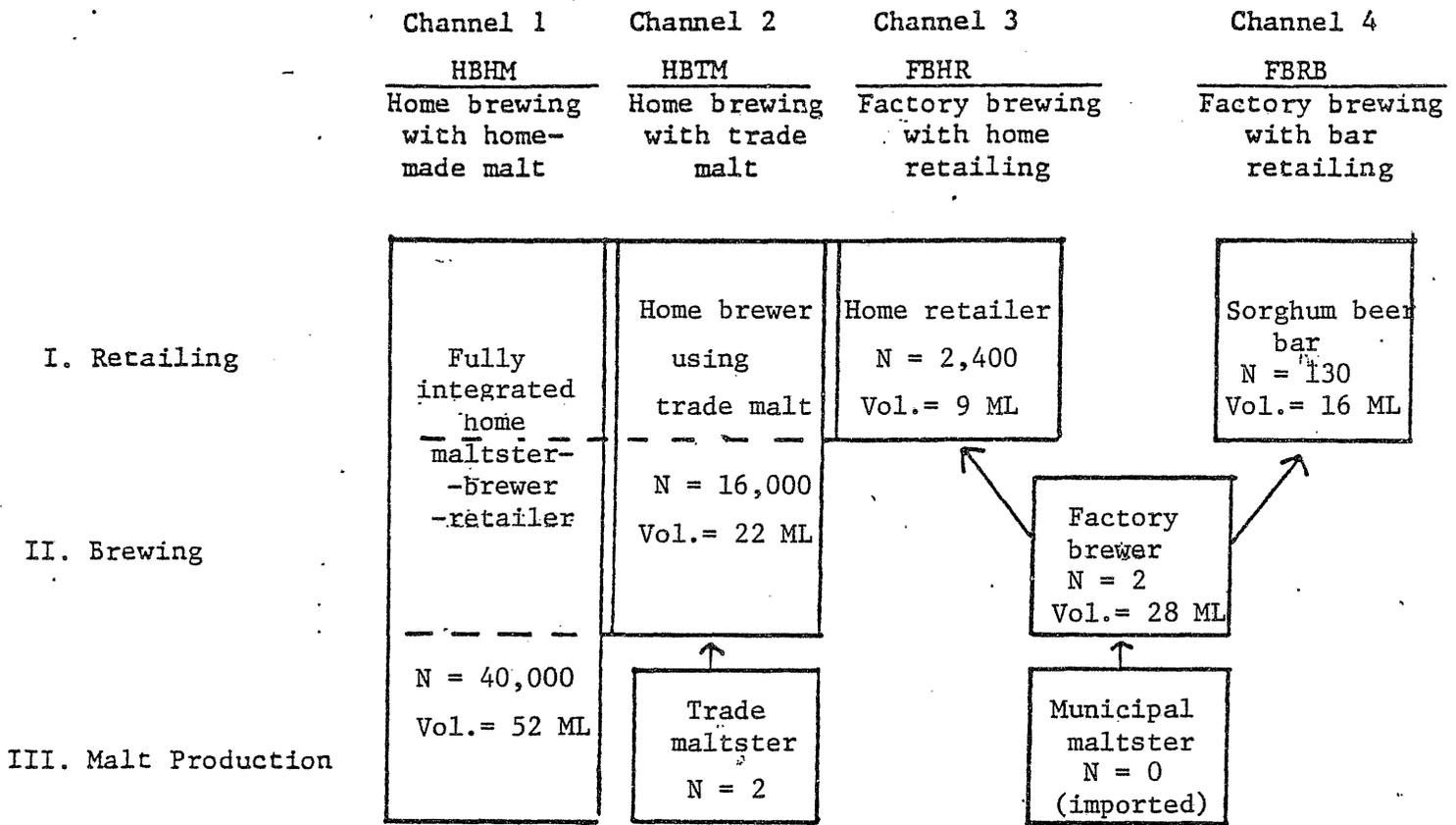
The evaluation literature also leads to some clear suggestions for specific types of intervention, particularly in credit projects where we have the greatest experiences, but also for other forms of direct small enterprise promotion. The evaluations of infrastructure provision in Botswana indicate that the projects failed the test of cost effectiveness because of overspecification of design standards. The project provided facilities of a standard far in excess of rural entrepreneurs' needs, ability and willingness to pay. This lesson is worth remembering as efforts turn to specifying necessary productive infrastructure in rural towns. Given the mixed record of rural electrification programs alone in stimulating rural business activity (Fluitman, 1981), questions of sequencing and complementarity will need to be explored. In these and other areas of RNFE promotion, those contemplating specific interventions would do well to examine in detail the references cited above, as they delve into more detail than is appropriate here.

the poor and rural dwellers. The effect of increases in factory brewing has been to transfer income from rural to urban areas, from women to men, and from poor to rich.

Two important policy conclusions emerged from this review. First, Channel 2, home brewing with trade malt, emerged as the optimal technology on both efficiency and equity grounds. Revelation of the gains to be had by encouraging the use of trade malt among home brewers, induced extension staff to work with trade maltsters to promote its use among Channel 1 home brewers. Switching to trade malt would enable them to produce more consistent brews, at lower cost, and remain competitive, with consequently beneficial employment, efficiency and equity impacts. Second, the study found that some District Councils had been misinterpreting retailing legislation which - in contrast with many neighboring countries who have outlawed home retailing of factory-brewed sorghum beer - made specific provision for home retailing in order that displaced home brewers could recoup lost brewing income by retailing factory brew. Discussions with errant Council staff rectified this problem, increasing home brewer income at very low cost, in an intervention that could only have been identified by activity specific, diagnostic work such as that embodied in the subsector approach.

FIGURE 11

SCHEMATIC OF THE FOUR ALTERNATIVE CHANNELS FOR PRODUCING AND DISTRIBUTING BULK SORGHUM BEER



N = number of enterprises Vol. = volume in million liters

-  enterprise boundary
-  division between functions within a firm
-  firms using identical technology at a given horizontal level in a production/distribution system
-  indicates flow of goods between firms

Source: Haggblade (1984).

TABLE 43

CRITERIA FOR COMPARING BOTSWANA'S ALTERNATIVE
INDIGENOUS BEERPRODUCTION/DISTRIBUTION CHANNELS^a
(1982 U.S. dollars)

	Channel 1 HBHM <u>Home Brewing Home-Made Malt</u>	Channel 2 HBTM <u>Home Brewing Trade Malt</u>	Channel 3 FBHR <u>Factory Brewing Home Retaining</u>	Channel 4 FBRB <u>Factory Brewing Bar Retailing</u>
1. Efficiency				
a. economic cost per unit of value-added	1.20	1.14	1.14	1.36
b. cereal requirements (tons)	25,000	15,700	15,200	15,200
2. Income Distribution^b (income percentiles)				
a. lowest 65 percent	\$ 5,570	\$ 6,010	\$ 4,240	\$ 3,540
b. 66 - 95 percent	5,040	3,960	4,150	3,510
c. richest 5 percent	940	1,420	3,810	5,100
	<u>\$11,550</u>	<u>\$11,390</u>	<u>\$12,200</u>	<u>\$12,150</u>
3. Geographic Distribution of^b <u>Income</u>				
a. rural	\$ 9,820	\$10,480	\$ 6,610	\$ 3,290
b. urban	1,730	910	5,590	8,860
	<u>\$11,550</u>	<u>\$11,390</u>	<u>\$12,200</u>	<u>\$12,150</u>
4. Sexual Distribution of^b <u>Income</u>				
a. female	\$ 9,240	\$ 7,340	\$ 4,790	\$ 6,560
b. male	2,310	4,050	7,410	5,590
	<u>\$11,550</u>	<u>\$11,390</u>	<u>\$12,200</u>	<u>\$12,150</u>
5. Employment				
a. full-time labor equivalents ^c	5,750	5,485	2,355	1,453
b. total number of people	22,990	23,724	23,344	2,127

^a Projections based on output of 100 million liters of bulk indigenous beer in each production/distribution channel.

^b Thousands of dollars.

^c A full-time labor equivalent equals 50 5-day weeks at 8 hours per day or 2,000 person-hours of work.

SOURCE: Hagglade (1987).

V. POLICY AND RESEARCH IMPLICATIONS

Several themes have recurred throughout this review. Together, they point in clear directions for policy makers and practitioners interested in balanced rural growth and in maximizing the rural nonfarm spinoffs of agricultural advance.

1. Agriculture will be the engine of rural growth.

Agricultural growth will be essential in launching successive rounds of rural growth. Consumption linkages appear particularly important, and agriculture will necessarily play a key role given that farmers constitute the largest rural consumer group by a considerable margin. Forward production linkages provide additional thrust, while backward linkages seem weakest among the inter-sectoral stimuli fostered by an agriculturally centered growth strategy.

Generating full advantage from agricultural growth multipliers will require increases in farmer productivity. Raising farm labor productivity not only permits the release of labor from agriculture to non-agricultural pursuits, it is also essential in boosting per capita income to levels that will enable consumer diversification from food into non-food items.

2. Policies matter in maximizing growth linkages.

Government policies affect not only the magnitude of agricultural growth but also the ability of rural nonfarm enterprises to respond to the production- and consumption-linked opportunities that ensue. Historically, African policy environments have hindered both locomotive and box-car. Macro policies have taxed agriculture for generations,

diminishing farmer incentives, farm output, farm income and hence both consumption and production multipliers. Investment codes and related legislation have regularly, if unintentionally, discriminated against small, rural nonfarm firms. The codes have treated large firms more generously than the small, conferring substantial competitive advantages on the large through tariff relief, subsidized credit, subsidized infrastructure, and access to foreign exchange at overvalued official rates. Of course, some policies have favored the small and the rural. Evidence from Kenya suggests that the recent imposition of a sales tax has led to a substantial jump in income and production by rural and urban informal sector firms at the expense of the large enterprises who cannot elude the fiscal net. So policies can work in both directions. But in the few cases where it has been possible to net out the impact of these countervailing preferences, the large firms emerge as distinctly favored by the sum total of the policy environment.

Beyond the general policy environment, industry-specific measures may have important implications for key rural nonfarm activities. The legal restrictions on home brewing in Zambian townships has clearly diminished employment in that country's largest nonfarm activity. Similarly, tariffs on hand tools and sewing machines have penalized rural producers in Nigeria and Sierra Leone. These inhibiting measures, because they are frequently confined to individual enterprise categories, can many times only be unveiled through industry specific reviews of important nonfarm activities. The subsector approach provides a promising vehicle for

activity specific diagnostic policy research of this nature (Boomgard et.al.1986).

3. Among RNFE, services and commercial enterprises will grow fastest.

The historical focus on manufacturing, by both policy makers and researchers, seems worthy of redirection. Spatial, time series and consumption data uniformly point, not to manufacturing, but rather to commerce and services as key growth sectors over the course of the rural structural transformation. Some manufacturing activities do grow as well, particularly food processing and preparation, tailoring, carpentry and metal work. But the exclusion of services and commerce from many promotional schemes on the grounds that they are "unproductive" is unfortunate. Services, in particular, are the activities best insulated from urban competition; hence consumption leakages are smallest in this sector. Service and commercial enterprises require credit, management and technical skills as well as access to key infrastructure if they are to attract a clientele commensurate with their potential. Certainly they should not be excluded from assistance programs. And although they present special problems for the researcher - because of mobility, size and location of operation - investigations of rural commerce and services would provide a useful supplement to the array of data now available of manufacturing and repair enterprises.

4. RNFE growth will be centered in rural towns.

Rural towns emerge as focal points in the development of the rural nonfarm economy. Cross-section data systematically identify dramatically higher densities of nonfarm activity in rural towns than in dispersed rural settlements. By providing nonfarm enterprises with catchment areas

sufficient to support minimum profitable scales of operation, rural towns offer firms the potential to exploit economies of scale and scope. Prospects for sharing equipment as well as the emergence of repair and support facilities induce enterprise establishment in rural towns. Moreover, the emergence of rural towns enables policy makers to provide necessary productive infrastructure at lower cost than would be possible under widely dispersed settlement patterns.

5. Infrastructure will be necessary for RNFE and rural town growth.

For rural towns to play their role in a balanced rural development process, it will be essential to assure adequate economic and social infrastructure to support nascent modern nonfarm activities. Physical infrastructure such as electricity, telegraph and telephone communications, water and roads will undoubtedly be important.

But our understanding of sequencing requirements and complementarity among infrastructural inputs remains imperfect. Anecdotal evidence on the rise of secondary cities in the Third World indicates that ground transportation - roads or railroads - are necessary first infrastructural investments (Rondinelli and Ruddle, 1978; Rondinelli, 1983). But beyond that, evidence remains elusive. The spotty record of rural electrification programs alone in fostering industrialization (Fluitman, 1981) suggests a need to review evidence on complementarities, sequencing and necessary additional conditions for generating productive impact from infrastructural investments. Further experience with both overbuilding and subsequent maintenance problems points to a need for collateral examination of levels of service demand, ability to pay and feasible

administrative mechanisms for financing rural infrastructure.

Closely related is institutional infrastructure which will be equally essential in fostering the transition to a more specialized, productive rural economy. Efficient rural financial markets will be particularly important. It appears that improvements on this front will require integration of the existing informal credit markets with the formal banking system. Such integration can improve the efficiency of existing informal markets in several ways: a) by enabling transfers of investment funds within and across regions in response to differential opportunities; b) by allowing the infusion of funds across regions to avoid the "covariance problem" of regional coincidence of need to recall loans and inability to pay in individual regional economies driven by good or bad harvests; and c) by substituting legal for social enforcement of contracts, a necessity in graduating up to large scale financing where the stakes and risk of default become too high for social enforcement to be effective. Work with credit unions and rural savings banks - often based on centuries old rotating and socially regulated capital transfer mechanisms - appear particularly promising for integrating the rural capital markets with the formal banking system (See Miracle, Miracle and Cohen, 1980; Binswanger and Rosenzweig, 1986; Haggbjale, 1978; von Pischke and Rouse, 1983; von Pischke, Adams and Donald, 1983).

Labor markets are also essential, and their increased efficiency will follow in the wake of improved communication and transport infrastructure. Economic and institutional infrastructure necessary to support rural factor markets will be essential in directing productive resources into

areas of highest return. And of course, improved communications and transport facilities can only increase competitiveness and efficiency of product markets as well.

6. Human capital investments will also be required.

Because much current writing emphasizes the need for investments in infrastructure, it is easy to overlook the collateral need for investments in people. Since services will be among the most rapidly growing rural nonfarm activities, investment in human capital will likely be essential for realizing those potential gains. Services depend more on skilled people than on equipment and infrastructure.

7. Direct assistance programs can be cost effective in promoting RNFE.

Many programs of direct assistance to RNFE, although by no means all, have generated B/C ratios exceeding 1. Least effective in general are programs which aim to provide a complete package of financial, technical and management assistance to individual firms. The poor performance of nursery industrial estates furnish eloquent testimony to this effect. Instead, programs that provide single missing ingredients seem to have fared far better, because they have identified situations in which all necessary components - market, entrepreneurship, management, technical skills, raw material procurement - except one are in place. Project provision of the one missing element enables businesspersons to exploit previously unattainable economic opportunities.

Credit programs have been most popular. Among them, projects providing working, rather than fixed, capital credit have typically generated the highest rates of return. Lending programs maintain an

additional attraction in that they operate in an arena where past experience provides the most effective guidelines for operational success.

The performance of technical and management assistance projects is not well documented. But evidence to date suggests a mixed record. Cost effective assistance will require careful following of the guidelines of the emerging small enterprise promotion evaluation literature.

8 . Women will play an important role in the emerging rural nonfarm economy. Many of the nonfarm activities that will grow most rapidly during structural transformation - activities such as food processing and preparation, tailoring, trading and many services - are female dominated. So too are many of the declining rural nonfarm occupations - basket making, mat making, ceramics and weaving. Consequently, women will be key actors in the economic transition of Africa's rural economy.

To facilitate their contribution to an accelerated rural transformation will require assistance agencies and governments explicitly recognizing the key role to be played by women. Among other actions, many assistance agencies will need to recruit more females as extension, banking and technical assistance staff. In addition, some key regulations will merit review, particularly those in many countries which limit financial transactions by married women. Numerous countries, for example, prohibit married women from holding their own bank accounts. Few topics strike closer to the viscera of African audiences than that of women's rights; and since the social ramifications of removing existing discriminatory legislation will have to be borne by the African societies, only they can make the necessary decisions. As outsiders, however, we

would be remiss in not alerting them to the very real efficiency costs that will likely be paid if women are not permitted to participate with full effectiveness in rural economic growth.

9. Research requires identifying priorities.

This review, in sorting through the delicate and spotty available evidence, has identified several key priorities for future research. In improving our confidence in estimates of growth multipliers, the key parameters to be measured are the marginal budget shares and expenditure elasticities for rurally produced nontradables. Those who analyze, and especially those who collect, rural consumption data would perform a vital service by tagging and highlighting the locational features of rural consumption decisions.

On the supply side of the rural nonfarm economy, it will be particularly important to start filling in descriptive and analytical profiles of the service and commercial sectors of the rural economy as a complement to the important, detailed work already undertaken on rural manufacturing and repair. Research in the future should also include both large and small, formal and informal firms within its purview. Past partial efforts leave us with nagging doubts about the sum total of the rural economy.

Subsector research is a promising means of doing this. By looking at key activities one at a time and reviewing the entire network of resources flows, from raw material procurement through processing and distribution, the subsector approach integrates analysis of the relevant manufacturing, commercial and service segments of the economy. And by including large

and small firms together, it provides useful indications of their competitive or complementary relationships in alternative channels thereby providing insights into future dynamics in each commodity subsystem.

Finally, we need more detailed review of the links between rural infrastructure and stimulation rural nonfarm activity. Questions of sequencing, complementarities, substitutability, necessary collateral inputs, and effective methods of financing and maintenance remain obscured.

10. Magnitude of the multipliers.

Based on the limited evidence available to date, we estimate Africa's rural agricultural growth multipliers to be on the order of 1.5. That is, a \$1 increase in agricultural incomes will generate about an additional 50 cents in rural nonfarm goods and services. This initial estimate places the African multipliers at about 60% of what they appear to be in the few Asian countries for which we have estimates.

Different types of agricultural growth - smallholder vs. largeholder, cash vs. food crops, tree crops vs. annuals, mechanized vs. animal traction or hand hoe agriculture - may generate different multipliers. But initial estimates, based on simple modeling calculations, suggest surprisingly little variation. Contrasting small farmers and estates, and tree crops as opposed to annuals, we have found that agricultural systems with high rates of value added in total production are those with low backward linkage with the rural economy. Hence the multipliers vary little within the range tested. We must caution that farm management and especially consumption profiles of the very wealthiest farms remain

elusive. As data from these very high income farmers become available, the range of agricultural growth multipliers may well widen. But it remains to be seen whether presumably lower rural consumption linkages will be offset by potentially greater production links.

Our preliminary hypothesis is that African multipliers are lower than those found in Asia because of a combination of different policies and different natural environments. The nature of African rainfall patterns and geology of river basins preclude cost effective irrigation a scale as large as in Asia. Hence backward linkages into pump supply, canal construction and maintenance, all currently important in Asian countries, will simply be unavailable in Africa. Population density is also much lower in Africa, requiring larger geographic catchment areas than in Asia to support minimum viable scales business activity. This diminishes the competitiveness of rural nonfarm producers contesting markets with large urban suppliers. In addition, African consumption patterns seem less diversified into nonfoods than in Asia. But at this stage it is not possible to say whether the difference is due to different income levels, differing preferences for urban and imported goods, measurement error stemming from the large share of nonmonetized goods and service transfers in Africa, or simply the result of an array of existing fiscal, trade and pricing policies which, coupled with lower levels of productive infrastructure, induce lower second round supply responses in rural Africa. We have much still to learn.

11. Government will play a key role.

But one lesson does emerge clearly. African governments have a major

role to play in facilitating the rural economic transformation and in maximizing rural growth linkages. To do so will require a mix of policy and investment decisions focused not only on agriculture but also on rural towns, since they are the laboratories in which rural nonfarm enterprises will incubate and grow.

APPENDIX

TABLE A.1

Rural NONFARM EMPLOYMENT CORRELATIONS, BASIC DATA

	Population		Area 000's Sq. Km.	Rural Density	GDP/ Capita	Ag.Share in GDP	Ag.Inc/ Capita
	1.Natl.	2.Relevant Rural					
Benin, 1961	2,106,000	1,896,600	112.6	16.8	302	0.55	166
Cameroon, 1976	7,131,833	5,126,610	475.0	10.8	615	0.32	197
Chad, 1964	3,254,000	2,351,160	472.2	5.0	222	0.47	104
Ghana, 1960	6,726,815	5,477,296	239.0	22.9	1,436	0.41	589
Ivory Coast, Bouake Region, 1963	630,000		23.3	27.0	547	0.38	208
Malawi, 1977	5,547,460	5,076,802	94.3	53.8	197	0.44	87
Mali, 1976	6,394,918	5,318,089	1,240.0	4.3	100	0.38	38
Mauritania, 1977	1,500,000	713,769	1,031.0	0.7	457	0.30	137
Mozambique, 1980	12,100,000	10,134,606	802.0	12.6	195	0.44	86
Rwanda, 1978	4,653,224	4,443,125	26.0	170.9	237	0.46	109
Senegal, 1970/71	4,038,000	2,262,006	196.0	11.5	575	0.25	144
Sierra Leone, 1974	2,970,000	1,605,570	72.0	22.3	363	0.34	123
Tanzania, 1978	17,440,000	15,099,709	945.0	16.0	297	0.51	151
Togo, 1970	1,950,646	1,969,493	56.0	35.2	399	0.35	140
Zimbabwe, 1982	7,501,470	5,573,592	391.0	14.3	574	0.15	86

SOURCES: IMF International Financial Statistics Yearbook, 1986; World Bank World Development Reports, various years; Population censuses as per references in Table 16.

TABLE A.2

REGIONAL VARIATION IN FARM AND NONFARM INCOME,
TOGO AND SIERRA LEONE

<u>Country/Regions</u>	<u>Agricultural Income Per Capita</u>	<u>Nonfarm Income Per Capita</u>
<u>Togo</u>	(thousands of CFA francs)	
Centrale	36.7	18.9
Plateaux	33.0	24.5
Centre-Nord	27.1	18.1
Savanes	17.7	8.4
Kara	12.0	14.1
<u>Sierra Leone</u>	(Leone)	
Riverain Grasslands	95	17
East	93	14
South Plains	83	21
South Coast	82	17
Bolilands	79	11
North Plain	69	15
North Plateau	50	10
Scarcies	42	30

SOURCES: ILO (1982); Matlon et.al. (1979).

TABLE A.3
REVIEW OF RURAL AFRICAN CONSUMPTION STUDIES

<u>Study</u>	<u>Location</u>	<u>Income Elasticity</u>	<u>MBS</u>	<u>ABS</u>
Adamu (1973)	Nigeria 8 urban	9 cons. categories by occupation farmers vs. others	---	compare by occupation
Dahl (1971)	Kenya, RU	41 categories	..	41 categories
Etukudo (1978)	Nigeria, RU	---	---	14 categories
Hazell and Roell (1983)	Gusau, Northern Nigeria	8 categories, includes locational designations	Yes	Yes
Humphrey and Oxley (1976)	Malawi, plus urban	2 foods; 25 nonfoods and 3 ag. inv. compares 7 African studies	---	---
King and Byerlee (1977, 1878)	Sierra Leone, R	11 food categories, 16 nonfoods, with locational and factory intensity designations	Yes	Yes
Massel (1969)	Kenya 1963	9 foods, 6 nonfoods	---	9 foods, 6 nonfoods
Malawi (1984)	Malawi	---	---	8 categories
Simmons (1976)	Zaria, N. Nigeria	---	---	4 categories, excludes durables
Sousa (1970)	Toqo, RU	8 categories	---	by Y level
	Chad, RU	8 categories		by Y level
	13 RU African locations	24 categories		by Y level
Tanzania (1972)	Tanzania RU + regions	---	---	41 categories by expenditure level also available for about 300 categories

NOTES: R = rural; U = urban; MBS = marginal budget share; ABS = average share; Y = income.

TABLE A.4

ESTIMATED RANGE OF AGRICULTURE'S RURAL VALUE ADDED
SHARE IN GROSS OUTPUT

	<u>Gross Output</u>	<u>Purchased Inputs</u>	<u>v</u>
<u>1. Annual Food Crops</u>			
Mixed food crops			
N. Nigeria, 1974	99.73	11.16	.89
	120.44	11.97	.90
	148.97	10.07	.93
Millet/sorghum			
Uganda, 1972	147.00	2.0	.99
Maize			
Ghana, 1971	166.0	4.0	.98
Kenya, 1974	317.0	24.0	.92
Malawi, 1972 (modern)	85	33.0	.61
Rainfed rice			
Cameroon, 1976-7	152.0	9.0	.94
Ivory Coast, 1974-5	203.0	12.0	.94
Liberia, 1972	122.0	7.0	.94
Sierra Leone, 1971	112.0	7.0	.94
<u>2. Annual Cash Crops</u>			
Cotton, smallholders			
Malawi, 1972 (modern)	256.0	68.0	.73
Tanzania, 1976	114.0	1.0	.99
Cotton, large holdings			
Sudan, Gezira 1973	7,012	775	.89
<u>3. Perennial Cash Crops</u>			
Cacao, estates			
Cameroon, 1971	154.0	33.0	.79
Coffee, estates			
Kenya, 1975	1,325	404.0	.70
Kenya, 1976	1,325	477.0	.64
Coffee, smallholdings			
Kenya, Nyeri 1977	2,535	200.0	.92
Pineapple, smallholdings (contract)			
Ivory Coast, Bonoua	2,262	1,455.0	.36
Ivory Coast, Bonoua	2,715	1,401.0	.48
Pineapple, estates			
Cameroon, Nyombe	9,654	5,497	.43

Table A.4 (CONT.)

4. Livestock

Dairy Farms, smallholdings			
Kenya, S. Baringo 1977	80	9	.89
Kenya, Kaimbu 1977	311	46	.85
Kenya, Kericho 1977	175	47	.73
Dairy Farms, large holdings			
Kenya, Njoro 1977	82	16	.80

SOURCE: Matlon (1979); Ruthenburg (1980).

TABLE A.5

ESTIMATED RANGE OF NONFARM RURAL VALUE
ADDED SHARE IN GROSS OUTPUT

	<u>Gross Output</u>	<u>Purchased Inputs</u>	<u>v</u>
<u>Baking</u>			
Botswana, 1982	375	153	.41
Sierra Leone, 1975	5,015	2,288	.47
<u>Tailoring</u>			
Botswana, 1982	156	70	.45
Sierra Leone, 1975	997	739	.74
<u>Milling</u>			
Botswana, 1982	480	440	.92
<u>Carpentry</u>			
Sierra Leone, 1975	2,452	1,625	.66
<u>Blacksmithing</u>			
Sierra Leone, 1975	1,084	754	.70
<u>Cement Block Manufacture</u>			
Botswana, 1982	400	170	.43
<u>Home Beer Brewing</u>			
Botswana, 1982	107	51	.48

SOURCE: Liedholm and Chuta (1976); Haggblade (1982).

TABLE A.6

ESTIMATES OF MULTIPLIER PARAMETERS BASED ON REGIONAL
INPUT-OUTPUT TABLES FOR TWO REGIONS OF IVORY COAST

	South East Region		Bouake Region	
	α	v	α	v
Food crops plus livestock	8.7	89.7	10.5	87.5
Cash crops (cocoa)	6.1	91.4	5.4	91.1
Agroprocessing	36.3	44.8	40.5	48
Wood industries	49.5	43.1	24.3	57.9
Vehicle repair	25.4	50.9	29.7	57.3
Other mechanical and electrical	17.4	66.7	6.4	85.3
Textiles	19.5	66.6	9.9	56.5
Leather and shoes	n.a.	n.a.	2.5	94.6
Vegetable and animal oils	42.8	56	45.6	46.8
Transport	26.1	58.1	29.2	59.3
Trade	8.4	90	19.7	78.5
<u>Average</u>	10.5	85.5	15.7	77.6

If $\beta = .3$, multiplier is 1.57 1.64

SOURCE: Ivory Coast (1965a, 1967a).

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