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WORKING PAPER

ANNUAL COSTS, RETURNS, AND SEASONAL LABOR REQUIREMENTS FOR SELECTED FARM AND NONFARM ENTERPRISES IN RURAL SIERRA LEONE

by
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ANNUAL COSTS, RETURNS, AND SEASONAL LABOR REQUIREMENTS FOR SELECTED FARM AND NONFARM ENTERPRISES IN RURAL SIERRA LEONE*

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FOREWORD

The African Rural Economy Program was established in 1976 as an activity of Michigan State University's Department of Agricultural Economics. The African Rural Economy Program is a successor to the African Rural Employment Research Network which functioned over the 1971-76 period.

The primary mission of the African Rural Economy Program is to further comparative analysis of the development process in Africa with emphasis on both micro and macro level research on the rural economy. The research program is carried out by faculty and students in the Department of Agricultural Economics in cooperation with researchers in African universities and government agencies. Specific examples of ongoing research are "Poor Rural Households, Income Distribution and Technical Change in Sierra Leone and Nigeria," "Rural and Urban Small-Scale Industry in West Africa," "Dynamics of Female Participation in the Economic Development Process in West Africa," and "The Economics of Small Farmer Production and Marketing Systems in the Sahelian Zone of West Africa."

Carl K. Eicher
Professor of Agricultural Economics
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1. INTRODUCTION

This report summarizes enterprise-specific data from a detailed survey of rural households in Sierra Leone conducted from May 1974 to April 1975. For each important farm and nonfarm enterprise in rural Sierra Leone, economic data are provided by region on costs, returns and prices. In addition, technical information such as seasonal labor inputs, yields, and wage rates are included where applicable.

These data are being published in the belief that they can be utilized for project preparation and policy decisions in Sierra Leone. Other reports in this series provide additional information from the same survey. Spencer and Byerlee [1976] summarize household data and budgets for each major farming system in Sierra Leone. Linsenmeyer [1976] and Liedholm and Chuta [1976] provide detailed analysis of the fishing and rural small-scale industrial sectors, respectively. Franzel [1979] analyzes factors affecting enterprise combination, while Jarrett [1978] analyzes enterprise profitability, and Eponou [1978] examines overall patterns of rural income distribution.

2. SOURCES OF DATA AND METHODS USED TO COMPUTE BUDGETS

2.1. Sampling Procedure

Areas as well as farmers were selected using stratified area sampling. The country was first divided into eight rural resource regions reflecting different ecological zones using available secondary data [Mitra, 1971]. Figure 2.1 shows the location of each resource region. Each of the eight rural resource regions was then subdivided into the enumeration areas used by the Central Statistics Office for the 1963 population census [Government

FIGURE 2.1
SIERRA LEONE RURAL RESOURCE REGIONS AND SELECTED
ENUMERATION AREAS

Region Codes

1. Scarcies
2. Southern Coast
3. Northern Plains
4. Riverain Grasslands
5. Bolilands
6. Upper Moa Basin
7. Northern Plateau
8. Southern Plains

of Sierra Leone, 1965]. Each enumeration area is about ten miles square and contains an average of 130 farm families, located in one to ten villages. Using the occupational distribution and the 1963 population of each enumeration area, all enumeration areas falling into or containing urban areas (defined as localities with more than 2,000 people and more than 50 percent of the labor force engaged in nonfarm activities) were rejected. Three enumeration areas were then selected at random to represent each resource region.

The next stage of the sampling procedure was the preparation of a list of households in each selected enumeration area providing a frame for selecting households, the primary unit of study. In this exercise enumerators visited all households in all villages in the selected enumeration areas and recorded the name and sex of each household head, the crops grown, and the nonfarm occupations of the household members. From these lists a stratified sample of twenty farm households and four nonfarm households (excluding traders) were selected at random in each enumeration area.

In the course of the survey some households were dropped from the sample because of deaths and movement from the village. Furthermore, at the time of analysis households with severe problems of missing data or data inconsistencies were also dropped. The final number of households analyzed was 328.

Between March 1974 and June 1975 selected households were visited twice weekly by resident enumerators who used eight types of questionnaires to collect the necessary information.

2.2. Data Analysis Methods

2.2.1. Definition and Selection of Enterprises

Enterprises were defined on the basis of distinct products or groups of jointly produced products. Thus, planted crops (largely upland rice and associated crops) were considered a single enterprise. Also, several systems of rice production (upland rice, inland swamp rice, mangrove swamp rice, riverain rice, and Boliland rice) were considered distinct enterprises because of the unique conditions under which each system is produced and because of the importance of rice, the staple food crop, in the economy of Sierra Leone.

A budget for an enterprise in this study was calculated from households in which that enterprise was considered important, i.e., households in which at least 10 percent of all labor inputs was absorbed by the enterprise in question, or 10 percent of total income resulted from that enterprise.

2.2.2. Valuation of Outputs and Inputs[1]

All outputs and inputs of seed were valued at a region-specific price for that product calculated as the weighted average farm gate sales price for the product over the year. The values of purchased inputs for each farmer were calculated at the actual price paid by individual farmers. The value of hired labor was calculated at the region-specific wage rate for that enterprise. No attempt was made to value family labor but rather the returns in each enterprise are expressed per unit of family

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[1] All values are expressed in Leones (Le) where Le 1.00 = $1.10 at the time of the survey.

labor input used in the enterprise. All labor data in this paper is in weighted male-labor equivalents using weights for females of .75 and for children of .50 based on relative wage rates for females and children (see Spencer and Byerlee [1977]).

There is no well-defined land market in Sierra Leone. However, land is often leased or "pledged," for a small amount of money which does not appear to vary much with the productivity of the land [Spencer and Byerlee, 1977]. The average region-specific land payment for each enterprise is used to value land.[1]

The value of fixed capital (including established tree crops) used in each enterprise was converted to an annual user cost using the formula:

$$K = \frac{rV}{1 - (1 + r)^{-n}}$$

where K is the annual service user cost, V is the original (acquisition) cost of the fixed capital asset, r is the discount rate, and n is the expected life of the asset. This procedure allows both the depreciation on capital and the opportunity cost of capital to be costed out.

In all cases a financial budget is presented for each enterprise using the actual prices received by sample farmers in an enterprise group as well as the opportunity costs of inputs. A 10 percent interest rate was assumed in calculating annual user service costs for all fixed assets. For those enterprises in which inputs are highly subsidized (i.e., where cultivation is partially mechanized) economic budgets were also presented valuing the subsidized input at the real cost to the nation. A shadow opportunity interest rate of 20 percent was used in such analysis. The

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[1]This average was computed from the sample of farmers for which a payment was made.

resulting returns therefore represent a "social" return after all costs are considered. The enterprise-specific unit costs and prices used on the calculations are reported in each budget.

2.2.3. Weighted Averages

All enterprise budgets for annual crops as well as tree crops (except oil palm) are expressed per acre. In making the calculations, averages weighted by the land area in that enterprise for a given household were used. This means that total quantities of inputs and outputs over all households were first calculated and then converted to per acre units by dividing by the total acres for that enterprise over all households.

2.2.4. Regional Classification

In general, the regional stratification used for sampling resulted in small numbers of households for construction of budgets in each of the eight resource regions. For all budgets reported in this monograph the eight resource regions have been aggregated into three larger regions: the North including the Scarcies, the Northern Plains, the Bolilands, and the Northern Plateau; the South including the Southern Coast, the Southern Plains, and the Riverain Grasslands; and the East which coincides with the Upper Moa Basin resource region. These aggregated regions closely follow the provincial boundaries in Sierra Leone, but also show important agro-climatic differences. The North has savannah areas and is generally dryer with annual rainfall of about 105 inches compared to the South with rainfall about 140 inches and the East with 120 inches. The rainy season in the East is longer and therefore favorable to coffee and cocoa production. In some cases the number of households with a given

enterprise is so small that only national budgets and labor profiles are presented.

3. GENERAL STATISTICS ON ENTERPRISE OCCURRENCE AND LABOR USE

3.1. The Importance of Different Enterprises in the Sampled Households

Before discussing enterprise budgets and labor profiles it is useful to examine the importance of different enterprises in household labor use and income generation. Rural economic activities were first classified into 24 enterprises listed in Table 3.1. The frequency of occurrence of these enterprises in the rural households and their share of income generated and labor use are presented in the table. Three criteria are used to measure the importance of a given enterprise. First, more than 1 percent of income or output from a given enterprise demonstrates the existence of that enterprise. Second, at the 10 percent level, the enterprise becomes important and third, at the 30 percent level the household can be regarded as specializing in the enterprise.

Upland rice is by far the most important enterprise in Sierra Leone. It was an important enterprise (10 percent of labor or income) in over 75 percent of rural households surveyed, although on aggregate it only contributed 26.7 percent of household income. Other enterprises such as inland swamp rice, cassava, groundnuts, other vegetables, wild oil palm and labor sold out by the household were found in over half of all sampled households although only inland swamp rice and oil palm[1] showed

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[1] The oil palm enterprise here refers to the gathering and processing of fruit from wild oil palm groves. Large and small scale oil palm plantations are now being established but at the time of field surveys in 1974/75 all plantations were not in production and hence are not represented in this study.

Table 3.1 THE IMPORTANCE OF DIFFERENT ENTERPRISES IN LAND USE, LABOR ABSORPTION, AND INCOME GENERATION IN RURAL SIERRA LEONE

Enterprise	% Households in Which:						% Enterprise Contribution		
	Household Participates[a]	Enterprise is Important[b]				Household Specializes[c]	Labor Absorption	Income Generation	Land Use
		South	North	East	National				
ALL FARM	99.7	99.3	98.5	97.9	98.8	94.5	86.5	78.9	100.0
Rice	97.9	95.0	89.1	95.9	92.7	85.1	61.9	41.3	81.7
Upland	85.4	85.8	65.9	89.8	78.0	70.7	47.3	26.7	61.8
Inland Swamp	52.7	14.9	31.2	49.0	26.8	9.4	7.6[d]	5.8[d]	5.6[d]
Mangrove	n.a.	2.8	n.a.	0	n.a.	n.a.	1.1[d]	1.4[d]	0.9[d]
Boliland (Hand & Mech.)	5.2	0	10.1	0	4.3	4.0	4.7	5.6	10.1
Riverain (Mech.)	4.3	9.2	0	0	4.0	3.0	1.2	1.8	3.3
Other Annuals	95.1	65.1	44.3	22.4	56.4	16.5	15.6	17.1	11.5
Fundi	18.9	0	26.1	0	11.0	2.1	2.1	1.3	2.1
Cassava	69.5	52.5	12.3	0	27.7	6.7	4.1	4.8	3.5
Groundnuts	52.1	20.6	24.6	22.4	22.6	2.4	5.0	3.9	4.9
Onions, Peppers, Tomatoes	16.5	1.4	18.1	2.0	8.5	6.1	3.8	4.3	1.0
Other Vegetables	49.7	12.0	11.5	2.0	10.4	0.3	0.6	2.8	-
Tree Crops	78.3	62.4	28.3	73.4	49.7	24.4	8.9	20.3	6.8
Fruits	21.0	2.4	1.4	0.7	10.2	0.3	0.3	0.8	-
Cocoa	11.3	0	0	40.8	6.1	1.5	0.6	1.7	1.9
Coffee	29.9	7.1	1.4	49.0	11.0	2.7	1.3	2.9	4.9
Oil Palm (wild)	67.4	58.1	26.1	28.6	40.2	20.1	6.2	14.9	-
Animals	3.4	0	1.4	0	0.6	0.3	0.1	0.2	-
NONFARM	93.0	56.0	50.7	36.7	50.9	17.1	13.3	21.1	-
Fishing	39.9	15.6	13.0	0	12.2	4.4	2.1	7.6	-
Hunting and Gathering	22.2	3.4	0.7	0.2	2.1	0	0.3	1.0	-
Small Industries	31.1	15.6	13.8	22.4	15.8	7.3	2.9	6.5	-
Tailoring	7.3	4.2	5.1	6.1	4.9	3.0	0.5	1.9	-
Carpentry	4.6	3.5	0.7	4.1	2.4	0.9	0.5	0.5	-
Blacksmithing	9.4	3.4	4.3	4.1	4.0	1.8	0.7	1.9	-
Spinning-Weaving	3.6	0.3	0	4.1	0.9	0	0.3	0.3	-
Other Small Industries	14.6	4.3	3.6	4.1	4.0	1.5	0.9	1.9	-
Trading	7.6	1.4	2.2	4.1	2.4	0.6	0.7	0.9	-
Labor Hired Out	69.5	31.2	24.6	12.2	25.6	5.2	7.3	5.1	-

[a]Households in which > 1% of total labor input goes to the particular enterprise.

[b]Households in which > 10% of the total labor input goes to the enterprise or > 10% of total income is generated by the enterprise.

[c]Households in which > 30% of total labor input goes to the enterprise or > 30% of total income is generated by the enterprise.

[d]An underestimate since northern mangrove swamps were not surveyed.

n.a.: not available

up as enterprises in which many households specialized (i.e., they absorbed 30 percent of labor or produced 30 percent of income). Coffee and fishing are enterprises occurring in over 20 percent of households but only rarely did the households specialize in their production.

There are also some infrequently occurring enterprises in which households tend to specialize. These include mangrove swamp rice, boliland rice, and riverain rice which are location-specific enterprises and the nonfarm enterprises, tailoring and metal work, which are skill-specific. In the calculation of budgets presented in the following sections, enterprises which are important in less than 1 percent of households are excluded since the number of households is very small for estimating average budgets even at the national level. Enterprises excluded are fruits, other vegetables, hunting and gathering, animal production[1], and spinning and weaving. Also, no budgets were prepared for the very heterogeneous classification - other small industries.

3.2. Household Labor Use

To help interpret seasonal labor profiles for specific enterprises the monthly distribution of total rural labor use in Sierra Leone households is shown in Figure 3.1. High labor use occurs during the upland rice growing season from June to November. The month of peak labor use is July

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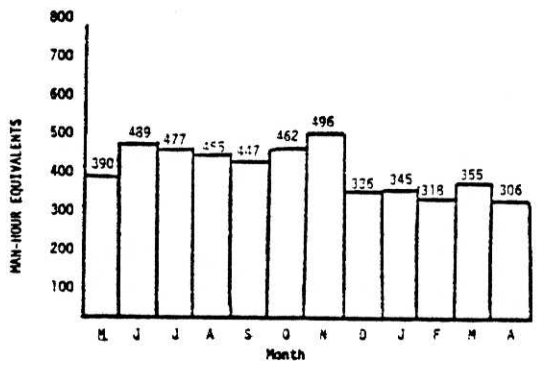
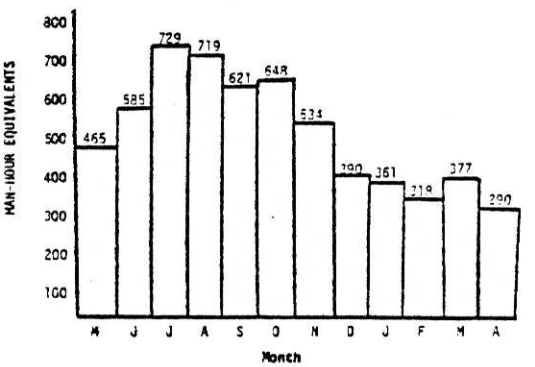
[1] In fact, the contribution of animals to rural income is probably underestimated in the sample because the data collection procedure was not specifically designed to collect information on income from animal production and because many cattle farmers are nomadic and thus could not be easily surveyed.

Figure 3.1
Monthly Distribution of Labor Used Per Household By Region in Rural Sierra Leone, May 1974-April, 1975

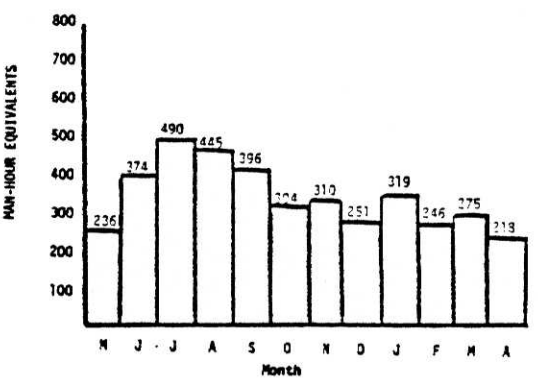
A. SOUTH



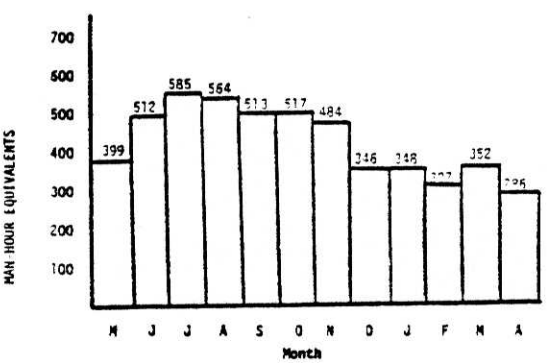
B. NORTH



C. EAST



D. NATIONAL



at the height of the swamp rice planting season when some upland crops are also being planted and weeded. The slack month is April which falls between the brushing and planting of upland rice farms.

Labor use shows greater seasonality in the North than in the South and East. This reflects the lower rainfall and shorter growing season, the greater importance of swamp rice which requires less land clearing in the dry season, and the lack of the tree crops, cocoa and coffee, which use slack-season labor.

4. RICE ENTERPRISES

4.1. Upland Rice

As shown in the previous section, upland rice is the most important enterprise in terms of area cultivated, labor used, and income generated in all regions of Sierra Leone. The practices used in cultivation have been described in detail by Spencer [1975b]. In general, upland rice is cultivated under a bush-fallow system with an interval of about 10 years between crops on the same land. It is also usually intercropped with cassava, maize, millets, benniseed, melon, etc. although rice is by far the dominant crop in the mixture.

Costs and returns to upland rice production by region, derived from the 1974/75 survey, are shown in Table 4.1. The average area planted was 5.15 acres with the smallest average area occurring in the East. The average upland rice farm acreages reported in Table 4.1 are about 30 percent higher than those reported by Spencer [1975b] for his 1971/72 survey and by the Government of Sierra Leone [1967 and 1975] for surveys in 1965/66 and 1970/71. This confirmed casual observations that there

Table 4.1 AVERAGE COSTS AND RETURNS PER ACRE FOR UPLAND RICE IN SIERRA LEONE, 1974/75
(Includes costs and returns of intercrops)

	South	North	East	National
I. Financial and Economic Analysis				
A. Basic data				
1. No. of cases	109	71	47	227
2. Average Size (acres)	5.22	6.20	3.42	5.15
B. Costs and returns (Le./acre)				
3. Value of output				
a. Value of rice	48.02	49.29	68.32	51.33
b. Value of intercrops	2.63	.71	1.13	1.62
c. Total value of output	50.65	50.00	69.45	52.95
4. Variable costs				
a. Seed	3.19	2.95	4.86	3.19
b. Fertilizer	0	0	0	0
c. Hired labor	10.54	10.85	10.19	10.62
d. Total variable costs	13.73	13.80	15.05	13.81
5. Gross margin	36.92	36.20	54.40	39.14
6. Tools and equipment	.38	.25	.29	.32
7. Net margin (to household labor, land, and management)	36.54	35.95	54.11	38.82
8. Land payments	2.77	1.42	0	1.79
9. Net margin to household labor and management	35.77	34.53	54.11	37.03
10. Net margin to household labor and management (¢/hr)	7.7	6.9	10.8	7.9
II. Technical data				
1. Yield/acre (lbs)	719	631	770	696
2. Seed rate (lbs/acre)	46	46	50	47
3. Fertilizer use/acre (lbs by farmers using 20-20-0 fertilizer)	-	-	-	33
4. % of farmers using fertilizer	-	-	-	4
5. Total labor/acre (hrs)	563	676	624	614
6. Enterprise wage rate (¢/hr)	8.4	6.1	8.1	7.9
7. Farm gate price (le/bushel)	4.01	4.69	5.41	4.42
8. Average age of bush cleared (yr)	11.4	9.6	8.2	9.8

was a substantial increase in upland rice farm sizes in 1974/75 in response to a doubling of the government-minimum producer price for paddy, making the government-minimum price competitive and effectively raising the farm gate price of domestically produced rice [Spencer, 1978a].

On the other hand, upland rice yields in 1974/75 were lower than average. Table 4.1 shows that the national yield was about 700 lbs. per acre, with yields in the South and East 14 and 22 percent higher than those in the North. These yields were about 35 percent below the averages reported in earlier surveys, cancelling out any gains in national rice production resulting from the increased farm sizes. The drop in upland rice yields in 1974/75 was due partly to the adverse distribution of rainfall in that year (rains were late and of shorter duration).

The values of intercropped products in Table 4.1 are low. They could be underestimated in these budgets since they are based on farmer's recall while yields of rice were estimated directly using yield plots. The value of all output is highest in the East in part because of higher yields, but also because of higher farm gate prices received by farmers in that area.

Inputs are minimal and are largely comprised of seed retained from a previous harvest and hired labor paid largely in kind. Fixed capital equipment is comprised of only hand tools such as cutlasses, axes, and harvesting knives.[1]

Production of upland rice required a labor input of about 600 man-hours/acre or about 90 man-days/acre, a figure consistent with earlier

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[1]See Spencer [1975b] for details of stock of tools and equipment owned by upland rice farmers.

survey findings. Figure 4.1 shows the monthly distribution of labor used for the production of an acre of upland rice. Peak monthly labor demand occurred in June, July, and August when planting and weeding take place. Labor requirements remain high and a secondary peak occurs in October and November during harvesting. After November, labor inputs are quite low until March when felling and brushing for the next crop is undertaken. These patterns are true of all regions although there are slight differences between regions. The national net returns to labor and management are exactly the same as the wage rate. Only in the East, where farm gate prices are higher, are farmers able to reap a return about 20 percent higher than the enterprise-specific wage rate.

4.2. Inland Valley Swamp Rice

After upland rice, inland swamp rice is the second most important rice production system and it is particularly important in the North. In this system, rice is grown under natural flooding of streams and often under continuous cultivation.

Inland swamp farm sizes are smaller than upland rice farms. Table 4.2 shows that average farm size was about 1.5 acres. On the other hand, yields were over twice those on uplands. Use of inputs is also somewhat higher on inland swamps with more seed per acre. Also a significant number of sampled farmers used fertilizer in the North.[1] Labor inputs in the North, where a higher proportion of swamp rice is transplanted, were 30

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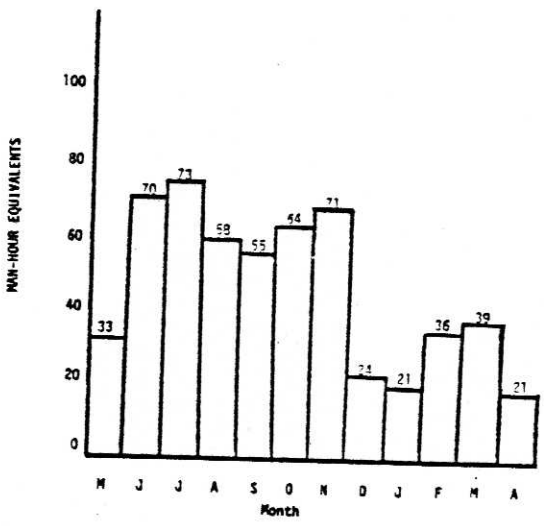
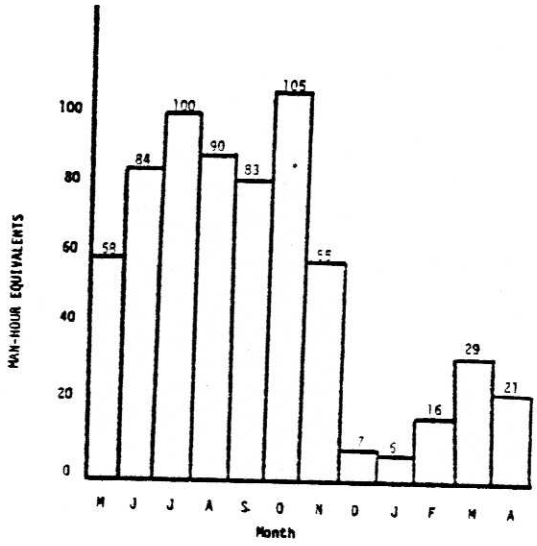
[1]The sample of farmers used in this monograph did not include any farmers in the Eastern or Northern Area Integrated Agricultural Projects where fertilizers are used in inland valley swamps. For an analysis of cost and returns on project farms see Spencer and Byerlee [1976].

Figure 4.1
Monthly Distribution of Labor Used for the Production
of An Acre of Upland Rice in Sierra Leone
May 1974-April 1975

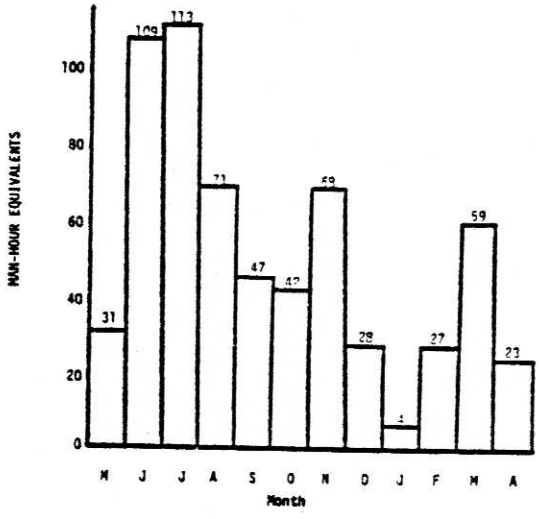
A. SOUTH



B. NORTH



C. EAST



D. NATIONAL

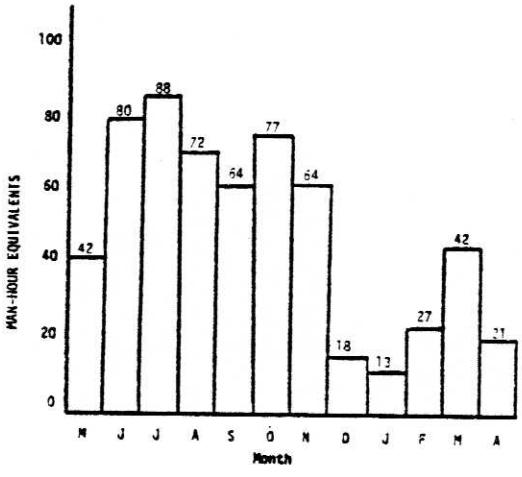


Table 4.2 AVERAGE COSTS AND RETURNS PER ACRE FOR INLAND VALLEY AND MANGROVE SWAMP RICE IN SIERRA LEONE, 1974/75[a]

	Inland Swamps			Mangrove Swamps
	North	South & East	National	South
I. Financial and Economic Analysis				
A. Basic data				
1. Number of cases	29	17	46	11
2. Average size (acres)	1.65	1.67	1.66	3.80
B. Costs and returns (Le./acre)				
3. Value of output	123.17	124.17	123.54	148.81
4. Variable costs				
a. Seed	7.15	3.33	5.74	6.08
b. Fertilizer	.77	0	.48	-
c. Hired labor	10.36	13.69	11.59	16.92
d. Total variable costs	18.28	17.02	17.81	23.00
5. Gross margin	104.89	107.15	105.73	125.81
6. Tools and equipment	1.67	1.22	1.51	1.26
7. Net margin to household labor, land and management	103.22	105.93	104.22	124.55
8. Land payments	5.96	5.25	5.70	2.77
9. Net margin to household labor and management	97.26	100.68	98.52	121.78
10. Net margin to household labor and management (¢/hr)	11.1	15.8	12.5	27.9
II. Technical data				
1. Yield per acre (lbs)	1635	1854	1716	2020
2. Seed rate (lbs/acre)	95	50	80	82
3. Fertilizer use/acre (lbs, 20-20-0 by farmers using fertilizer)	130	-	130	-
4. % of farmers using fertilizer	34	0	22	0
5. Total labor/acre (hours)	1009	776	923	625
6. Enterprise wage rate (¢/hr)	7.7	8.7	8.5	8.9
7. Farmgate price (Le/bu)	4.52	4.02	4.32	4.42
8. % of farmers transplanting	75	62	68	100

[a]Farmers in the Integrated Agricultural Development Projects and mangrove swamp farmers in the Scarcies area not included.

percent higher than those in the South, confirming a relationship identified in earlier surveys [Spencer, 1975a]. Labor inputs were also over 50 percent higher than those of upland rice. But all returns to land as well as to labor for these basically traditional inland swamp rice farms are substantially higher than those for upland rice.

The seasonal distribution of labor in inland swamp rice (Figure 4.2) shows more pronounced peaks and slacks than for upland rice. In the North, a sharp labor peak occurs in July and August when land preparation, planting, and transplanting are undertaken. There is then a period of less work until harvesting in December. In the South and East the peaks occur about a month later. After harvest, labor inputs to swamp rice are almost zero until the next cycle. In general, the planting and harvesting of swamp rice lags behind the comparable operation in upland rice by one to two months.

4.3. Mangrove Swamp Rice

This system of rice production is described extensively in Spencer [1975c]. Briefly, the rice is produced around river estuaries particularly those of the Little and Greater Scarcies and the Jong, Ribbi, and Bumpe rivers. Rice fields on the river banks are subjected to flooding through the tidal movement of the water level. The most important production areas are along the Scarcies River. Unfortunately, mangrove swamp farms in this area are not included in this study.[1] The results reported

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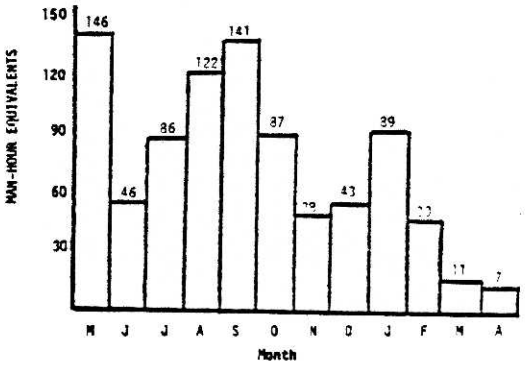
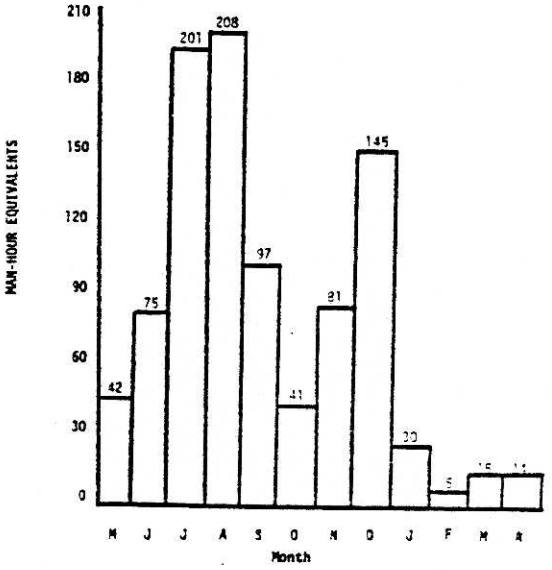
[1]The enumeration area with mangrove swamp farms in the Scarcies area had to be abandoned half way through field work because of data falsification by the enumerator.

Figure 4.2
Monthly Distribution of Labor Used for the Production of an Acre of Inland Valley Swamp Rice and an Acre of Mangrove Swamp Rice in Sierra Leone, May 1974-April 1975

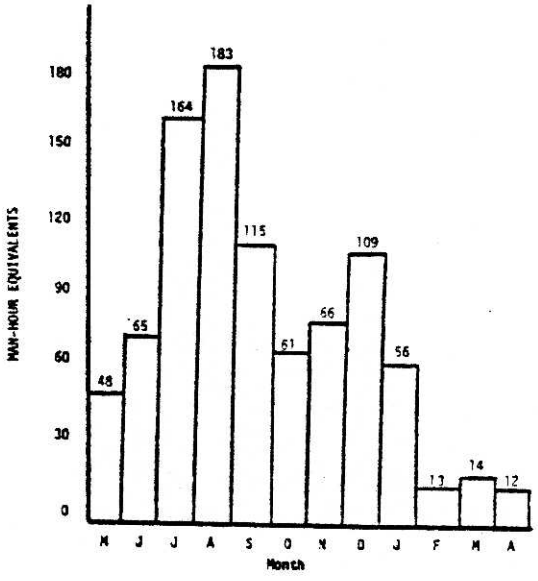
A. INLAND SWAMPS: SOUTH & EAST



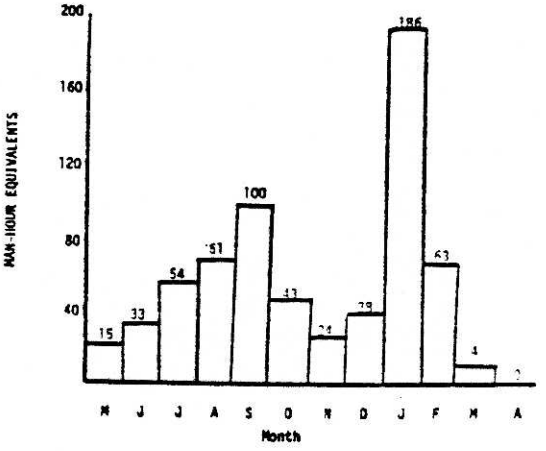
B. INLAND SWAMPS: NORTH



C. INLAND SWAMPS: NATIONAL



D. MANGROVE SWAMPS: SOUTH



here are from the South coast along the Jong and Ribbi river estuaries. Table 4.2 shows that acreages are quite large averaging 3.80 acres, virtually the same as the 3.7 acres reported by Spencer [1975c] for the 1971/72 survey. Yields were the highest of all rice production systems examined in 1974/75 although the labor input is almost identical to that for upland rice, a result similar to that obtained in earlier surveys. Seasonal labor inputs are high between July and September, the time of land preparation and transplanting, then have a very sharp peak at harvest time in January (Figure 4.2).

4.4. Riverain Rice

Riverain rice production systems occur along the banks of the Sewa and Wange rivers on the South coast from Mattru to Tormabum. Rice is planted on the grassy flood plains which are flooded up to 15 feet in the rainy season. Floating rice varieties are used in the lower flood plains. The flat open land is ideal for mechanical ploughing although some hand cultivation is practiced.[1]

Considering that the farms studied were partially mechanized, farm size was not very large, about the same as upland rice farms, and much less than that of mechanized Boliland farms (Table 4.3). Variable costs are comparable to upland rice with higher cash requirements for tractor hiring but lower cash and in-kind expenditures for hiring labor. Labor inputs are very low partly because of mechanical ploughing, but also because very little weeding is undertaken since the farmers surveyed were mainly

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[1]The sample size of hand-cultivated farms was too small to permit analysis here.

Table 4.3 AVERAGE COSTS AND RETURNS PER ACRE FOR RIVERAIN AND BOLILAND RICE IN SIERRA LEONE, 1974/75

	Riverain	Boliland	
	Mechanized	Mechanized	Hand
I. Financial analysis			
A. Basic data			
1. No. of cases	12	9	4
2. Average size (areas)	5.29	12.7	8.4
B. Costs and returns (Le/acre)			
3. Value of output	67.25	72.10	61.40
4. Variable costs			
a. Seed	1.84	3.80	4.50
b. Mechanical services	7.00	6.80	0.0
c. Fertilizer	.16	1.20	0.80
d. Hired labor	2.77	3.10	3.10
Total variable	11.77	14.90	8.40
5. Gross margin	55.48	57.20	53.00
6. Tools and equipment	0.40	0.50	0.50
7. Net margin to household labor, land and management	55.04	56.71	52.51
8. Land payments	0	2.10	0.70
9. Net margin to household labor and management	55.04	54.60	51.80
10. Net margin to household labor and management (¢/hour)	23.8	35.70	19.20
II. Economic Analysis			
A. Cost and returns (Le/acre)			
1. Value of output	67.25	72.10	61.40
2. Variable Costs			
a. Seed	1.84	3.80	4.50
b. Mechanical services	46.67	46.67	0.0
c. Fertilizer	.48	3.60	2.40
d. Hired labor	2.77	3.10	3.10
e. Total variable costs	51.76	57.20	10.00
3. Gross margin	15.49	14.90	51.40
4. Tools and equipment (including 20% opp. cost)	.48	.50	.50
5. Net margin to household labor land and management	15.01	14.40	50.90
6. Land payments	0	2.10	0.70
7. Net margin to household labor and management	15.01	12.30	50.20
8. Net margin to household labor and management (¢/hour)	6.5	8.0	18.6
III. Technical data			
1. Yield per acre (lbs)	1621	1008	858
2. Seed rate (lbs/acre)	43	53	63
3. Fertilizer use/acre (lbs), by farmers using 20-20-0 fertilizer	32	60	37
4. % of farmers using fertilizer	17	100	100
5. Total labor/acre (hours)	259	193	317
6. Enterprise wage rate (¢/hr)	9.5	7.0	7.0
7. Farmgate price (Le/bushel)	2.49	4.29	4.29

cultivating newly cleared land. This, coupled with the favorable flood regime in the Riverain grasslands in 1974/75, meant that harvesting was less labor demanding. The resulting labor input figures of 260 hours or roughly 40 man days per acre, were substantially lower than those reported by Spencer [1975a] in his 1971/72 survey when the flood regime was unfavorable.

During July and August when fields are deeply flooded, labor inputs are virtually zero (Figure 4.3). The first peak of labor demand occurs during the planting period in May and June when seeds are broadcast and harrowed in by hand, on land which has been ploughed by tractors. A second peak occurs in October and November during the bird-scaring and harvesting period.

Yields during the survey year were 1621 lbs/acre - over double the yields recorded by Spencer [1975a] in 1971/72. This further indicates the considerable variability and high risk nature of riverain rice production when yields as well as inputs are sensitive to the flood regime.

Because tractor cultivation is highly subsidized, an economic budget is also presented in which the cost of tractor ploughing and fertilizer are set at the unsubsidized prices to reflect government cost of these inputs.[1] These calculations show that while the financial rates of return to farmers are relatively high, the real economic rates of return to labor and land fall below those of upland rice. Thus, riverain rice production is highly profitable to individual farmers, but for the country as a

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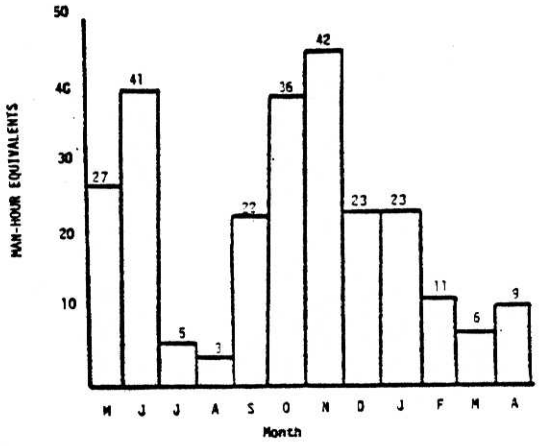
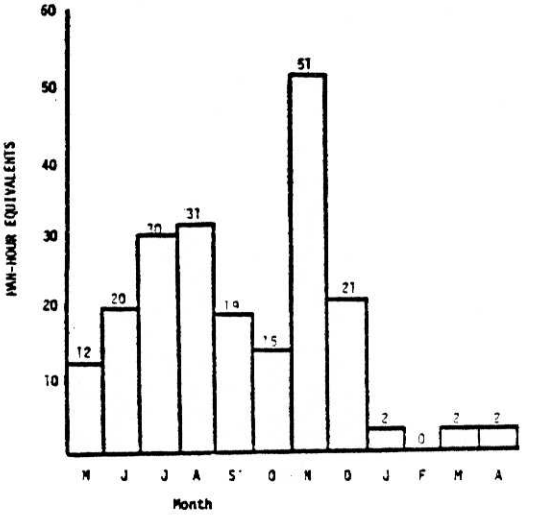
[1]Government subsidies on fertilizer were estimated at 67 percent of total cost in 1974/75 while they were 85 percent for tractor cultivation (ploughing and harrowing).

Figure 4.3
Monthly Distribution of Labor Used for the Production of an Acre of Riverain Rice and an Acre of Boliland Rice in Sierra Leone, May 1974-April 1975

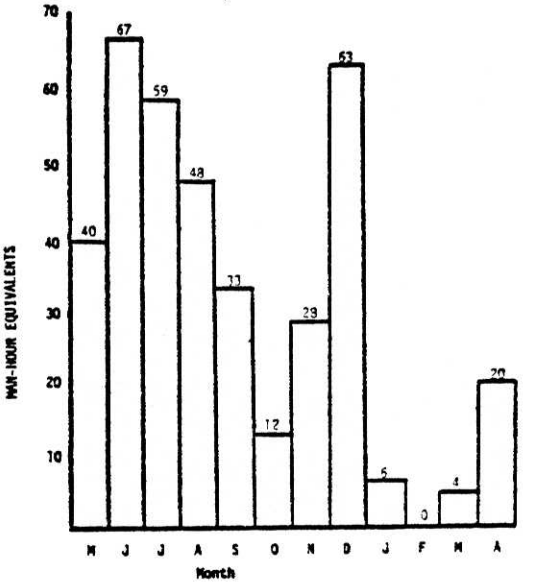
A. RIVERAIN-MECHANIZED



B. BOLILAND-MECHANIZED



C. BOLILAND-HAND



whole, considering the high cost of mechanical cultivation in Sierra Leone, it is a marginal activity.

4.5. Boliland Rice

Acreages in Boliland rice production are the largest of all farm enterprises analyzed (Table 4.3). Farmers using the government tractor-hire service for land preparation farm an average of 12.7 acres, an area 50 percent larger than those of farmers using only hand cultivation. The average size of hand-cultivated farms for Boliland rice was about 50 percent larger than that for upland rice. Returns to land are not high because of yields which are the lowest of all rice production systems except upland rice. All farmers use fertilizer but because of low rates of application and subsidized prices, actual costs of fertilizer are low.

Labor inputs into Boliland rice are lower than that of all other rice production systems except that of mechanical riverain rice. Mechanization of Boliland rice cultivation reduces labor requirements by more than one-third compared to hand cultivation. The low labor inputs into Boliland rice result in high financial returns to labor, particularly for mechanically cultivated farms. However, because tractor cultivation is heavily subsidized, the economic returns, taking into account actual costs of fertilizer and mechanical services, are substantially less than those for hand-cultivated boliland rice and of the same order as for upland rice production.

Labor profiles presented in Figure 4.3 show substantial differences in seasonal labor requirements between hand and mechanically cultivated Boliland rice farms. Hand-cultivated rice requires more labor for land preparation and planting from May to August with another peak at harvest

in December. Mechanically cultivated rice on the other hand has one sharp peak labor requirement in November for harvesting.

5. OTHER ANNUAL CROPS

5.1. Fundi (African Three Fingered Millet)

Fundi is a short season annual crop widely grown in the drier northern parts of Sierra Leone as a security crop to supplement food requirements which are largely provided by rice. Table 5.1 shows that returns are similar to, but slightly lower than, those for upland rice. Labor inputs are also comparable to those for upland rice although the labor profile is somewhat different (Figures 5.1). Land preparation and planting take place in May and June and harvesting in August and September, at least one month before upland rice is harvested.

5.2. Groundnuts

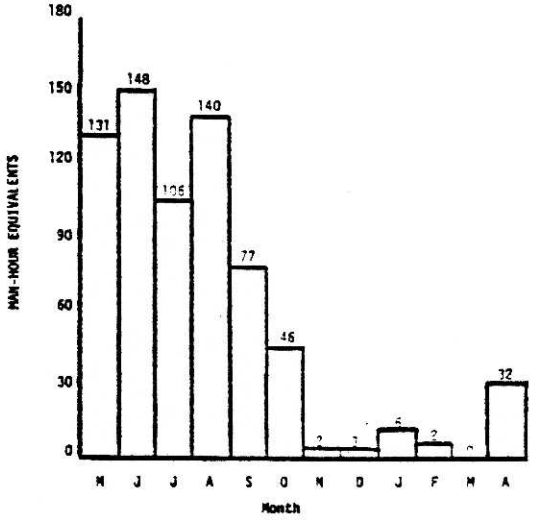
Groundnuts are grown in small acreages (1.3 acre/farm) throughout the country. In most cases they are grown on the previous year's upland rice field and are mainly tended by the women of the household [Spencer, 1978b]. Costs and returns (Table 5.1) are similar to those for upland rice although returns to both land and labor are slightly higher. Labor inputs are also similar to those for upland rice but the seasonal labor profile is different (Figure 5.1). Land preparation and planting are usually performed in April and May before upland rice is planted, and harvesting occurs in September. The labor inputs in groundnuts in the North are much more uniform throughout the season than in the South, where there are distinct peaks in the April/May and September periods.

Table 5.1 AVERAGE COSTS AND RETURNS PER ACRE FOR FUNDI AND GROUNDNUTS IN SIERRA LEONE, 1974/75

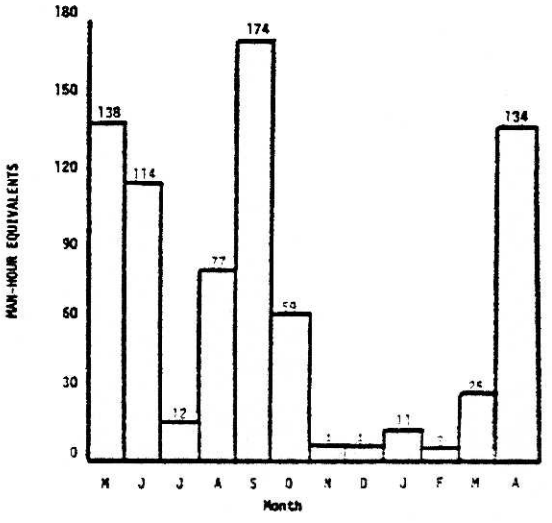
	Fundi	Groundnuts		
	North	South	North	National
I. Financial and economic analysis				
A. Basic data				
1. No. of cases	33	22	34	62
2. Average size (acres)	1.24	1.16	1.48	1.31
B. Costs and returns (Le/acre)				
3. Value of output	42.12	56.01	78.19	70.17
4. Variable costs				
a. Seed	4.51	3.93	4.55	4.35
b. Hired labor	2.56	6.23	1.86	3.61
c. Total variable costs	7.07	11.31	7.06	8.71
5. Gross margin	35.05	45.85	71.78	62.21
6. Tools and equipment costs	.28	.44	.37	.38
7. Net margin to household labor, land and management	34.77	45.41	71.41	61.83
8. Land payments	.22	4.60	2.60	3.00
9. Net margin to household labor and management	34.55	40.81	68.81	58.83
10. Net margin to household labor and management (¢/hr)	5.4	5.9	12.2	9.9
II. Technical data (per acre)				
1. Yield/acre (lbs)	571	915	1284	1146
2. Seed rate (lbs/acre)	78	88	88	88
3. Total labor/acre (hrs)	678	788	589	646
4. Enterprise wage rate (¢/hr)	7.2	6.2	7.8	7.0
5. % of farmers using fertilizer	0	0	0	0
6. Farmgate price (Le/bushel)	4.42	3.67	3.65	3.66

Figure 5.1
Monthly Distribution of Labor Used for the Production of an Acre of Fundi and an Acre of Groundnuts in Sierra Leone, May 1974-April 1975

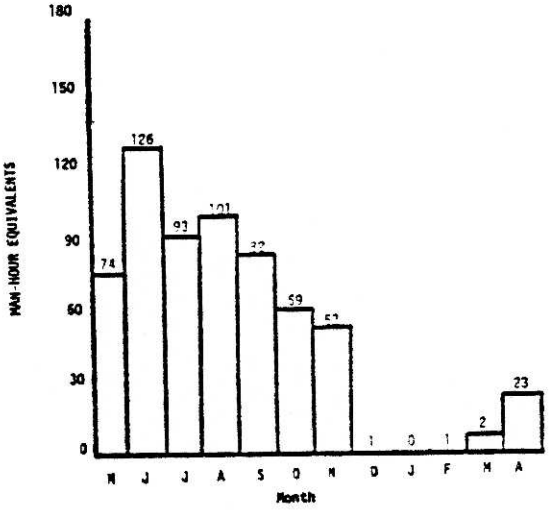
A. FUNDI



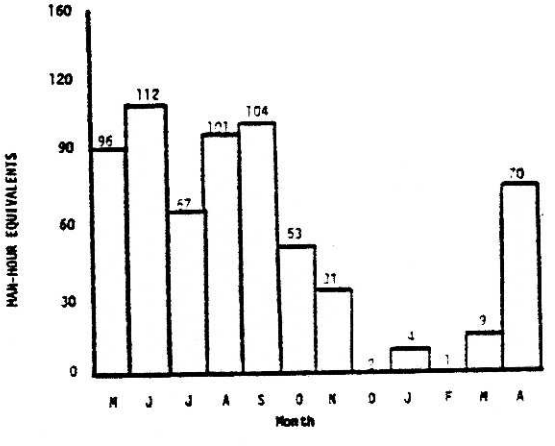
B. GROUNDNUTS: SOUTH



C. GROUNDNUTS: NORTH



D. GROUNDNUTS: NATIONAL



5.3. Cassava

Cassava is grown largely in the coastal regions of the North, in the East, and in the South as a food reserve and supplement to the preferred food, rice. Data for cassava presented in Table 5.2 and Figure 5.2 must be treated with caution since (a) it is a long season crop which is usually not planted and harvested during the same crop year, (b) it is often planted as an intercrop in upland rice fields in the South but harvested 6-12 months after the rice, and (c) it was impossible to estimate physical units of cassava yield, hence, output had be recorded only in value terms. An effort has been made here to include only cassava planted in pure stands, but it was often difficult to make the distinction. Moreover, planting and harvesting labor usually refers to different cassava fields and is therefore not strictly comparable. Table 5.2 shows that both labor inputs and variable costs for cassava were very low, leading to returns to land above upland rice and very high returns to labor. Labor inputs into cassava cultivation are evenly spread throughout the March/August period when the crop is planted and weeded as well as harvested.

5.4. Onions, Pepper, and Tomatoes

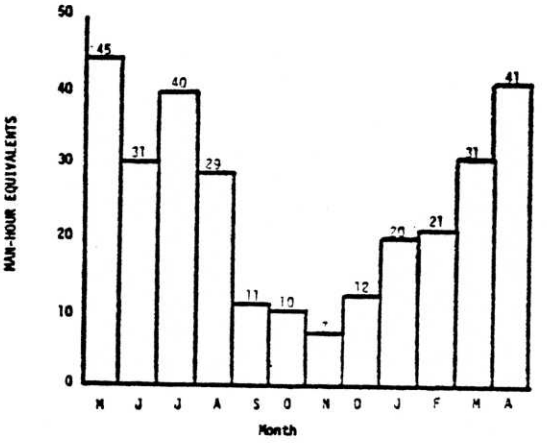
The budget presented in this monograph (Table 5.2) is drawn from farmers who produced these crops on a commercial basis in low land areas of the Bullom peninsula close to Freetown. Average acreages are small (.68 acres) but returns per acre are the highest of all crop enterprises analyzed. They were three times higher than the returns per acre of even inland and mangrove swamp rice. But variable costs are also high because of the higher cost of seed and some use of fertilizer. Also, labor inputs

Table 5.2 AVERAGE COSTS AND RETURNS PER ACRE OF CASSAVA AND ONIONS, PEPPERS, AND TOMATOES (OPT) IN SIERRA LEONE 1974/75

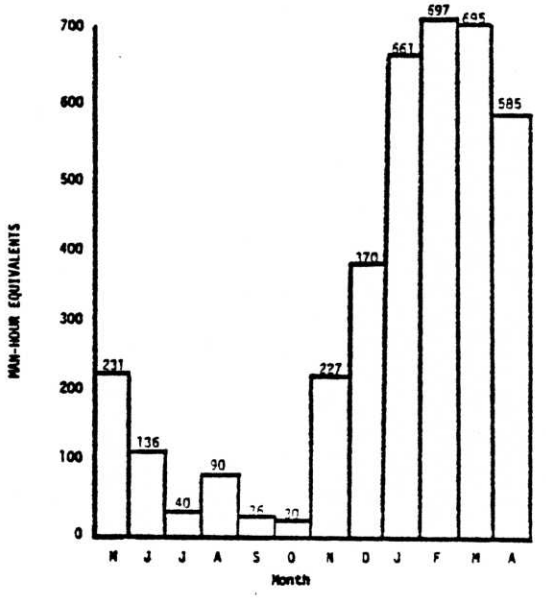
	Cassava	OPT
	South	North
I. Financial and economic analysis		
A. Basic data		
1. No. of cases	70	25
2. Average size (acres)	1.37	.68
B. Costs and returns (Le/acre)		
3. Value of output	58.1	398.53
4. Variable costs		
a. Seed	-	15.35
b. Fertilizer	-	2.38
c. Hired labor	0.91	10.24
d. Total variable costs	0.91	27.97
5. Gross margin	57.59	370.56
6. Tools and equipment	.25	1.19
7. Net margin to household labor, land and management	57.34	369.37
8. Land payments	1.16	16.33
9. Net margin to household labor and management	56.18	353.04
10. Net margin to household labor, and management (¢/hour)	23.7	10.0
II. Technical data		
1. Fertilizer use/acre (lbs, by farmers using fert.)	-	258
2. % of sample farmers using fertilizer	0	28
3. Total labor/acre (hrs)	247	3619
4. Enterprise wage rate (¢/hour)	10.0	13.0

Figure 5.2
Monthly Distribution of Labor Used for the Production of an Acre of Cassava and an Acre of Onions, Peppers, and Tomatoes (OPT) in Sierra Leone, May 1974-April 1975

A. CASSAVA: SOUTH



B. ONIONS, PEPPERS AND TOMATOES: NORTH



are very high because of the use of such practices as hand watering, mulching, and transplanting so that although returns per acre are very high, returns per unit of labor input are about the same as those for other annual crops. These crops are largely dry season crops planted in swampy areas so that labor inputs are concentrated in the dry season months from January to April (Figure 5.2).

6. TREE CROPS

6.1. Wild Oil Palm

Throughout the country wild oil palm trees are harvested and the fruits processed into palm oil, the most important cooking oil used in Sierra Leone. This is the most important tree crop enterprise in the country. In some areas there are substantial acreages of smallholder oil palm plantations, particularly in the chiefdoms around the Gambia and Daru oil palm plantation. In our sample there were too few of these farmers with trees of bearing age to be able to construct a crop budget for small holder oil palm plantations. Since wild oil palm trees are scattered throughout the land area controlled by a household, it was impossible to estimate acreages; hence, the budgets presented here are on a per household rather than per acre basis.

Output of wild oil palm consists of palm oil, palm kernels, palm wine, and palm kernel oil, all of which involve some processing. In fact most of the labor input into this enterprise is processing labor. Unlike the budgets of most other enterprises in this monograph, the budgets presented here are for both production (harvesting) and processing.

On the average, palm kernels were the most important component of output but in the North, palm wine was also very important (Table 6.1).

Table 6.1 AVERAGE COSTS AND RETURNS PER ENTERPRISE FOR WILD OIL-PALM PRODUCTION AND PROCESSING IN SIERRA LEONE, 1974/75

	South	North	East	National
I. Financial & Economic Analysis				
A. Number of cases	75	31	14	120
B. Costs and returns (Le/case)				
1. Value of output				
a. Palm wine	4.53	44.94	4.22	14.93
b. Palm oil	73.41	34.26	67.86	62.64
c. Palm kernels	119.23	41.44	51.79	91.27
d. Palm kernel oil	.13	.06	6.83	.90
e. Total value of output	197.30	120.70	130.70	169.74
2. Variable costs				
a. Hired labor (processing)	3.44	.57	1.47	2.52
b. Hired labor (harvesting)	2.89	2.70	3.03	2.83
c. Total variable costs	6.33	3.27	4.50	5.35
3. Gross margin	190.97	117.43	126.20	164.39
4. Tools and equipment	.53	.24	.07	.37
5. Net margin to household labor and management	190.44	117.19	126.13	164.02
6. Net margin to household labor and management (¢/hour)	28.1	16.0	44.8	25.4
II. Technical data				
1. Palm oil production/household (tins)	9.75	4.16	6.34	7.75
2. Palm kernels/household (bu)	31.46	12.91	12.36	24.21
3. Total labor/enterprise (hrs)				
a. Processing labor/household (hrs)	447	327	117	384
b. Harvesting labor/household (hrs)	282	426	141	303
c. Total labor/household (hrs)	729	753	318	687
4. Enterprise wage rate (¢/hr)	12.2	14.4	12.2	12.5
5. Farmgate price				
a. Palm kernels (Le/bushel)	7.53	8.23	10.70	8.08
b. Palm oil (Le/tin)	3.79	3.21	4.19	3.77

Palm kernels may be directly gathered from the dried fruit which has fallen from wild oil palm trees or may be a by-product in processing the palm oil. After cracking, the kernels are usually sold for cash to representatives of the Sierra Leone Produce Marketing Board buying agents although in the East some palm kernel oil is produced. Palm oil is produced for both home consumption and sale while palm wine and palm kernel oil are produced mainly for home consumption.[1]

Variable costs are low in the wild oil palm enterprise and returns to labor are quite high, about twice the enterprise wage rates. There are considerable regional variations in returns reflecting mainly variations in farm gate prices. Labor inputs are approximately equally divided between labor for harvesting and processing and are generally relatively evenly distributed throughout the year (Figure 6.1). Peak labor requirements in the South are in April and May, and the lowest labor inputs in October and November. In the North, where palm wine tapping is a year round activity, there are less well defined labor peaks.

6.2. Coffee

Coffee production is concentrated in the East with some production in the South. The average farmer has a little over 1 acre of coffee but yields are low averaging about 230 lbs/acre in 1974/75. Returns to land (Table 6.2), although higher than that for most upland crops, are lower than that for swamp rice. The low yields are the primary cause of the low returns per acre. On the other hand, because of the low labor inputs, the returns to labor are higher than those for swamp rice.

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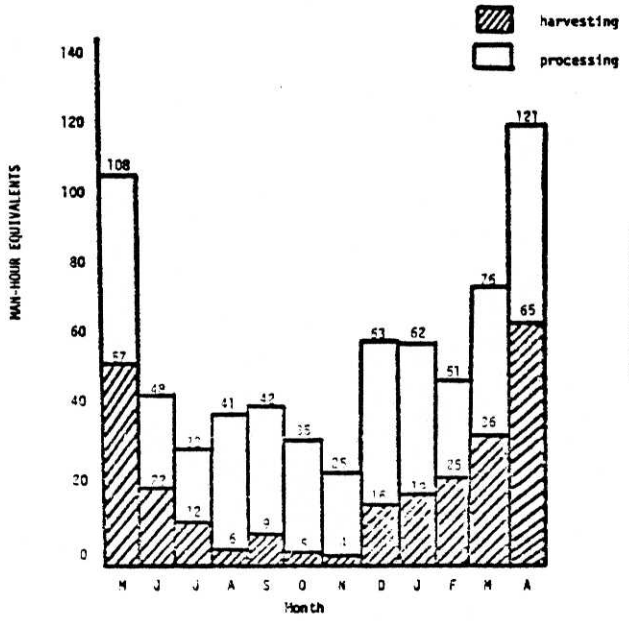
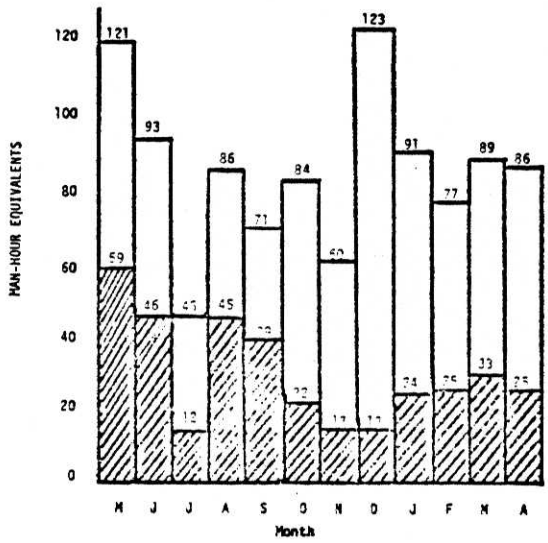
[1] See Roberts [1978] for details of palm oil processing techniques.

Figure 6.1
Monthly Distribution of Labor Used for the
Production and Processing of Wild
Oil Palm Products in Sierra Leone
May 1974-April 1975

A. SOUTH



B. NORTH



C. NATIONAL

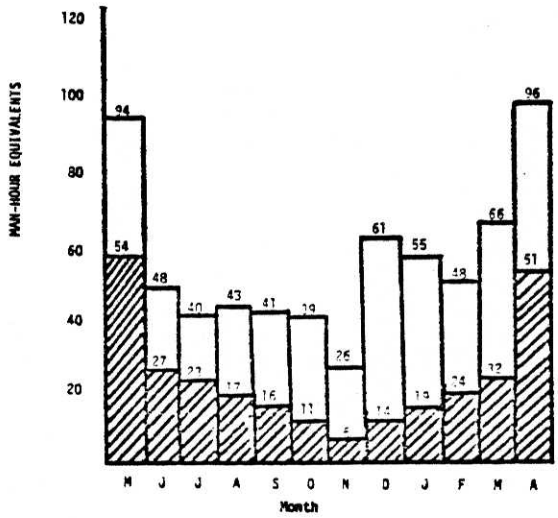


Table 6.2 AVERAGE COSTS AND RETURNS PER ACRE OF COFFEE AND COCOA PRODUCTION IN EASTERN SIERRA LEONE, 1974/75

	Coffee	Cocoa
I. Financial and economic analysis		
A. Basic data		
1. No. of cases	27	13
2. Average size (acres)	1.07	2.13
B. Costs and returns (Le/acre)		
3. Value of output	83.63	88.01
4. Variable costs		
a. Hired labor	2.71	2.38
b. Total variable costs	2.71	2.38
5. Gross margin	80.92	85.63
6. Establishment cost factor	9.36	9.36
7. Tools and equipment	.17	.17
8. Net margin to household labor, land and management	71.39	76.10
9. Land payments	0	0
10. Net margin to household labor and management	71.39	76.10
11. Net margin to household labor and management (¢/hour)	16.9	33.5
II. Technical data		
1. Yield per acre (lbs)	227	310
2. Total labor/acre (hours)	457	255
3. % farmers using fertilizer	0	0
4. Enterprise wage rate (¢/hour)	7.7	8.9
5. Farmgate price (Le/bushel)	17.50	17.00

In general, low-level management of coffee is practiced. Maintenance consists largely of one underbrushing prior to harvest. Almost no pruning was undertaken and chemical sprays against diseases were hardly used in 1974/75. Labor inputs for coffee peak sharply in December and January when underbrushing and harvesting are performed. At other times of the year labor inputs are almost zero (Figure 6.2).

6.3. Cocoa

Cocoa is grown almost exclusively in the East. Costs and returns per acre are similar to those for coffee (Table 6.2). Cocoa farmers have a larger acreage (2.1 acres). Because underbrushing cocoa is easier than underbrushing coffee, labor inputs are lower and returns to labor are higher than that of coffee. Most labor inputs occur between August and November, the period of underbrushing, harvesting, and processing (Figure 6.2).

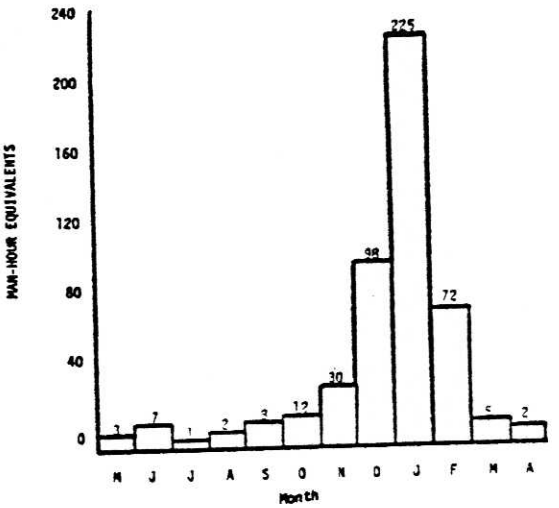
7. NONFARM ENTERPRISES

7.1. Fishing

Fishing is an important enterprise along the Sierra Leone Coast and has been extensively analyzed by Linsenmeyer [1976]. Here only an average budget is presented to compare costs and returns to other enterprises. Marine (salt water) fishing has the highest output value and the highest capital and input costs per enterprise of any of the enterprises examined (Table 7.1). This results in one of the highest returns to labor of any rural enterprise exceeded only by returns to inland (fresh water) fishing and wild oil palm production and processing in the East. Labor inputs peak slightly from September to November and again during the dry season

Figure 6.2
Monthly Distribution of Labor Used for the Production of an Acre of Coffee and an Acre of Cocoa in Eastern Sierra Leone, May 1974-April 1975

A. COFFEE



B. COCOA

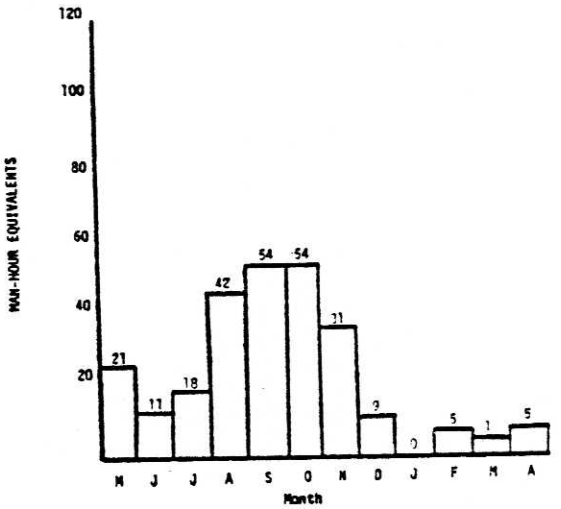


Table 7.1 AVERAGE COSTS AND RETURNS PER ENTERPRISE FOR MARINE AND INLAND FISHING IN SIERRA LEONE, 1974/75

	MARINE North	INLAND Nationwide
I. Financial analysis		
A. Basic data		
1. No. of cases	13	18
B. Costs and returns (Le./case)		
2. Value of output	896.00	72.22
3. Variable costs		
a. Inputs	193.00	-
b. Hired labor	26.35	0.07
c. Total variable costs	219.35	0.07
4. Gross margin	676.65	-
5. Annual cost of capital*	147.60	0.89
6. Net margin to household labor and management	529.05	71.26
7. Net margin to household labor and management (¢/hour)	36.8	64.7
II. Economic analysis		
A. Costs and returns		
1. Value of output	896.00	-
2. Variable costs		
a. Inputs	193.00	-
b. Hired labor	26.35	-
c. Total variable costs	219.35	-
3. Gross margin	676.65	-
4. Annual cost of capital*	199.73	-
5. Net margin to household labor and management	476.92	-
6. Net margin to household labor and management (¢/hour)	33.2	-
III. Technical data		
1. Total labor per enterprise (hours)	1,611	125
2. Enterprise wage rate (¢/hour)	15.2	13.2
3. Total cost of capital	720	-

*Assuming 7 year life of equipment, 20% interest rate.

(Figure 7.1). But overall, the distribution is relatively even, the effect of the wide adoption of improved technology in the form of outboard motors which allow fishermen to go out further to sea even during the rainy season, and to bring back a larger catch [Linsenmeyer, 1976].

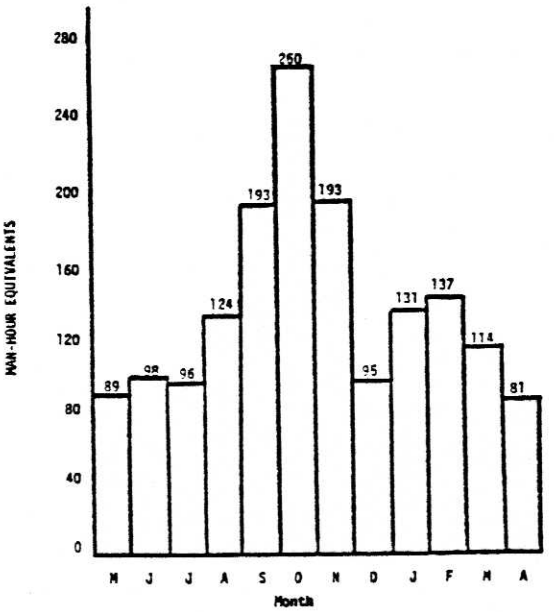
Fresh water fishing is common as a minor enterprise throughout the country, but in the South it is an important enterprise in some households. Most equipment, such as nets and baskets, is handmade. Returns to labor are very high in this enterprise, but since the sample included many households that participated in a "fish drive" which occurs about one year in three in one southern inland lake, the budget reflects returns in a good year.

7.2. Small-Scale Industries - Carpentry, Blacksmithing, and Tailoring

The rural small-scale industries - blacksmithing, carpentry, and tailoring are extensively described and analysed in Liedholm and Chuta [1976]. Again, average budgets are presented for purposes of comparison with agricultural enterprises. Costs of capital in these enterprises are considerably higher than those of annual crop enterprises. Moreover, returns per unit of labor are high, particularly for blacksmithing and tailoring (Table 7.2). Labor inputs are generally highest during the dry season, the period of low agricultural activity (Figure 7.2). Labor use in blacksmithing is heavy during May when tools are repaired at the start of the planting season. Tailoring labor use shows two peaks in May and October, coinciding with the two Moslem festivals in that year.

Figure 7.1
Monthly Distribution of Labor Use Per Household in Small-Scale Fishing and Processing Production in Sierra Leone, May 1974-April 1975

A. MARINE FISHING: NORTH



B. INLAND FISHING

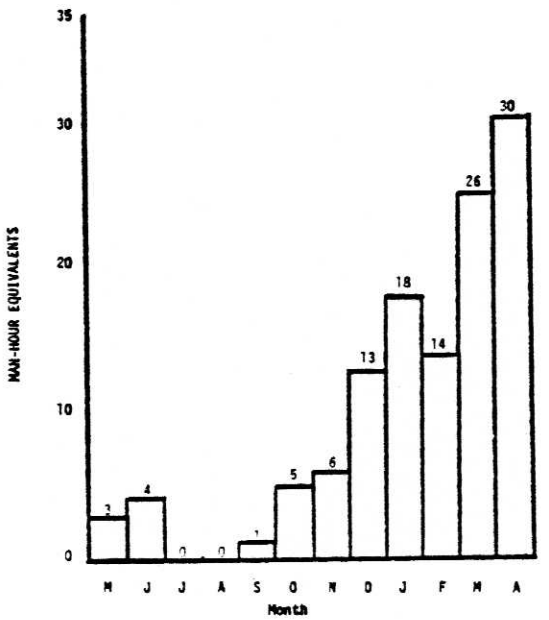
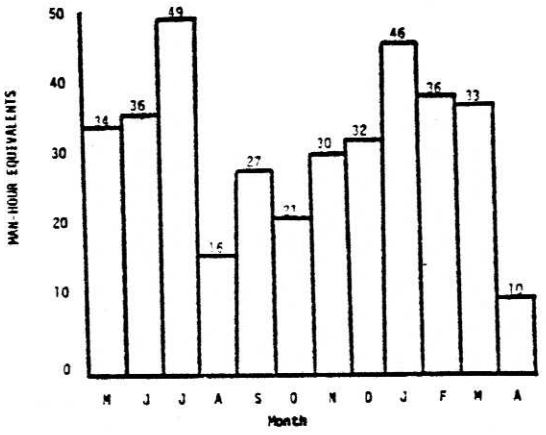


Table 7.2 AVERAGE COSTS AND RETURNS PER ENTERPRISE FOR SMALL SCALE INDUSTRIAL FARMS IN RURAL SIERRA LEONE, 1974/75

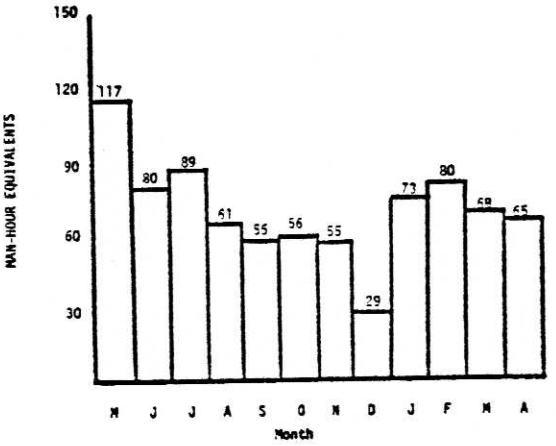
	Carpentry	Blacksmithing	Tailoring
I. Financial analysis			
A. No. of cases	16	14	19
B. Costs and returns (Le/enterprise)			
1. Value of output	55.62	251.29	171.11
2. Variable costs			
a. Inputs	3.94	10.71	6.74
b. Hired labor	2.60	1.95	-
c. Total variable costs	6.54	12.66	6.74
3. Gross margin	49.08	238.63	164.37
4. Annual cost of capital	8.97	9.14	15.51
5. Net margin to household labor and management	40.11	29.49	148.86
6. Net margin to household labor and management (¢/hour)	12.1	27.7	32.1
II. Economic analysis			
A. Costs and returns (Le)			
1. Value of output	55.62	251.29	171.11
2. Total Variable Costs	6.54	12.66	6.74
3. Gross margin	49.08	238.63	164.37
4. Annual cost of capital	13.74	14.01	23.77
5. Net margin	35.34	224.62	140.60
6. Net margin to household labor and management (¢/hour)	10.6	27.6	30.4
III. Technical data			
1. Total labor/enterprise (hours)	358	342	463
2. Enterprise wage rate (¢/hour)	10.0	14.2	
3. Value of capital (Le)	61.00	62.21	105.50

Figure 7.2
Monthly Distribution of Labor Use for Small-Scale Industrial Firms in Rural Sierra Leone, May 1974-April 1975

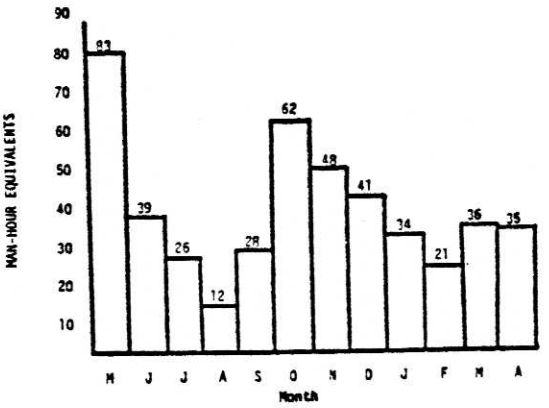
A. CARPENTRY



B. BLACKSMITHING



C. TAILORING



8. SUMMARY

Net margins per acre and returns to labor and management per hour under financial analysis are summarized by enterprise in Table 8.1. Among the important group of upland annual crops such as upland rice, fundi, groundnuts, and cassava the returns to land are quite uniform around Le. 50 per acre. The tree crops, coffee and cocoa, have returns per acre somewhat higher. The crops grown on lowlands and swampy lands, specifically onions, peppers, and tomatoes have returns per acre generally higher than upland annual crops but show a great deal of variability.

Similar but less uniform patterns can be observed in returns to labor. The upland annual crops (with the exception of cassava) have the lowest returns to labor and returns per hour are close to the rural wage rate of about 8 cents per hour. The tree crops and lowland rice crops generally have returns per hour two to four times higher than this figure although inland valley swamp rice and onions, peppers, and tomatoes have returns only slightly higher than the upland annual crops. Nonfarm enterprises (except carpentry) also have high returns to labor.

Returns are approximately the same under economic analysis as under financial analysis,[1] except for mechanized Boliland rice and mechanized riverain rice. Although these two enterprises have relatively high returns under financial analysis, they rank among the enterprises with the lowest returns under economic analysis.

Peak months for labor input are also shown in Table 8.1. These peak months can be interpreted by recalling from Section 3.2 that June to

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[1]The distinction between financial and economic analysis is explained in Section 2.2.2. Financial analysis presents the costs and returns to an enterprise from the participant's perspective. Economic analysis, on the other hand, shows costs and returns from society's perspective.

Table 8.1 SUMMARY OF RETURNS TO LAND AND LABOR UNDER FINANCIAL ANALYSIS, AND PEAK LABOR MONTHS BY ENTERPRISE IN SIERRA LEONE, 1974/75[a]

	Net margin to land, labor & management (Le/acre)	Net margin to household labor & management (¢/hour)	Peak Labor Month(s)
Rice Enterprises			
Upland	38.82	7.9	June, July, Oct
Inland Valley Swamp	104.22	12.5	July, Aug
Mangrove Swamp	124.55	27.9	Jan
Riverain-Mechanized	55.04 (15.01)	23.8 (6.5)	June, Nov
Boliland-Mechanized	56.71 (14.40)	35.7 (8.0)	Nov
Boliland-Hand	52.51	19.2	June, Dec
Other Annuals			
Fundi	34.77	5.4	June, Aug
Groundnuts	61.83	9.9	June, Aug, Sept
Onions, Peppers, Tomatoes	369.37	10.0	Jan-April
Cassava	57.34	23.7	April, May
Tree Crops			
Wild Oil Palm	-	25.4	April, May
Coffee	71.39	16.9	Jan
Cocoa	76.10	33.5	Sept, Oct
Nonfarm			
Marine Fishing	-	36.8	Sept, Nov
Inland Fishing	-	64.7	March, April
Carpentry	-	12.1	Jan, June
Blacksmithing	-	27.7	May-July
Tailoring	-	32.1	May, Oct

[a]Where net margins under economic analysis differ significantly from those under financial analysis, net margins under economic analysis are shown in parentheses. The distinction between financial analysis and economic analysis is explained in Section 2.2.2.

November are the busiest months and December to May the period of less work for Sierra Leone rural households. Thus the upland annual crops and the lowland crops almost always have peak labor requirements during the busy season. The notable exceptions are cassava which is largely harvested in the dry season and onions, peppers, and tomatoes which are planted and harvested in the dry season. On the other hand the tree crops except cocoa require labor in the slack period from December to April. Finally the nonfarm enterprises show a mixed pattern. Marine fishing and blacksmithing require labor in the peak period while other nonfarm enterprise have at least one peak month falling in the slack labor period.

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