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# AFRICAN RURAL EMPLOYMENT RESEARCH NETWORK

## WORKING PAPER

A PROGRESS REPORT ON RESEARCH  
ON RURAL SMALL SCALE INDUSTRY  
IN SIERRA LEONE

by  
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## THE AFRICAN RURAL EMPLOYMENT RESEARCH NETWORK

The African Rural Employment Research Network was initiated in 1971 by a group of scholars interested in comparative analysis of the development process in selected African countries with emphasis on rural employment problems. The research program has been jointly designed by scholars in African countries, at Michigan State University and at other universities in North America. Research emphasis is being directed to Sierra Leone, Nigeria and Ethiopia. In addition, individual scholars in other countries, such as Ghana, Zaire and Tanzania, are carrying out research on rural employment problems and are members of the Network.

The research program emphasizes joint and individual studies of rural employment such as the demand for labor in alternative production systems and in the rural nonfarm sector, the migration process as a link between rural and urban labor markets and the impact of macro-economic policies on labor absorption in agriculture. Attention will be directed to developing policy models to trace the consequences of alternative strategies of agricultural development on farm output, employment, income distribution and migration and to incorporating the employment objective into project, sub-sector and sectoral analysis in developing countries.

The Network maintains links with similar research networks in Latin America (ECIEL) and Asia (CAMS) and with organizations such as the FAO, ILO and the World Bank.

African Rural Employment Papers are distributed without charge to libraries, government officers and scholars.

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A PROGRESS REPORT ON RESEARCH ON RURAL  
SMALL SCALE INDUSTRY IN SIERRA LEONE\*\*\*

by

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The purpose of this paper is to summarize the progress made to date on the rural small scale industry component of the African Rural Employment Project, Njala University College. The problem setting will be discussed first, followed by a description of the scope of the research project. The preliminary results of phase I of the project, the phase which was designed to obtain a point estimate of the population of Sierra Leone's small scale industrial establishments, will then be discussed. There will next follow a discussion of progress made on phase II, which was designed to provide more detailed data on a more selected sample of these establishments over an entire year. The proposed methods to be used to analyze these data will then be discussed. A final section will examine the policy relevance of the study.

#### Problem Setting

Over the past few years, African governments, including the Sierra Leone Government, have become increasingly aware of and concerned with the need to develop effective strategies and policies for developing their small scale industries, particularly those located in the rural area. In Sierra Leone, this interest paralleled the Government's growing disenchantment with the import substitution industrial strategy that it had been pursuing since Independence. Although the import substitution strategy was designed to foster the development of large scale, urban based, largely foreign owned firms in the country, the results obtained were disappointing.

The limited success of this policy is clearly revealed from an examination of Sierra Leone's industrial statistics. From 1965/66 until 1970/71, for example, Sierra Leone's manufacturing sector grew at an annual real rate

of only 2 percent.<sup>1/</sup> The sector thus grew even slower than the economy as a whole, which increased at an annual real rate of 3.7 percent during this same period. Moreover, even though the manufacturing output increased slightly during this period, the number employed in the "large scale" manufacturing sector actually declined at a 4.5 percent annual rate.<sup>2/</sup>

One of the first official indications that the Government was rethinking its industrialization strategy was provided in the 1974 Budget Speech of the Minister of Finance. As the Finance Minister stated, "Our experience over the past ten or more years has shown that import substitution by itself is a limited and insufficient strategy of industrial development." In particular, he stressed that the policy resulted in a "failure to develop domestic raw materials sufficiently for local processing and export" and "discriminated against labor-intensive industries." Thus, he declared that, "it is only the promotion of industries based on our natural resources, especially agricultural products, that offers the greatest hope of achieving...the Government's main (industrial) objective" of providing "employment for our people" [Government of Sierra Leone, 1972-b, p. 5]. In particular, small scale industries, especially those in rural areas, were to play an important role in the new industrial strategy [Government of Sierra Leone, 1974-b, p. 186].

During the period when the Government was pursuing its import substitution strategy, however, it did relatively little to encourage or promote

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<sup>1/</sup> Computed from data in [Government of Sierra Leone, 1972-a, p. 8].

<sup>2/</sup> Computed from data supplied to the Bank of Sierra Leone by the Ministry of Labor [Bank of Sierra Leone, 1972, Table 33]. According to the Ministry of Labor, "large scale" refers to firms employing more than six persons. Similar results of declining employment combined with increasing manufacturing output are reported to have occurred in other African countries following import substitution industrial policies (see Frank [1968]).

small scale industrial establishments. Except for reserving a few manufacturing activities to citizens and for making some minor provisions for financing, the Government pursued essentially a policy of benign neglect with respect to small scale establishments.<sup>3/</sup> Indeed, one might argue that by offering substantial subsidies and concessions only to large scale firms the Government was, in effect, penalizing the smaller firms and making it relatively more difficult for them to compete effectively. The 1960 Development Ordinance, for example, was designed to attract large scale establishments to the country by offering these firms substantial tax concessions [Government of Sierra Leone, 1971, p. 1]. One of these tax concessions enabled the large firms to reduce or waive the import duty on their raw materials for a specified period. By not permitting the smaller firms to qualify for a similar exemption, the smaller firms faced higher relative prices for their raw materials and, thus, were correspondingly accorded a smaller amount of effective tariff protection than were the larger firms.<sup>4/</sup> Another example of a policy that discriminate against small scale industry was the Government's decision to establish near Freetown an industrial estate in which

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<sup>3/</sup> In 1969, a Non-Citizens Act was passed which debarred foreigners from the manufacture of cement blocks, wooden and metal furniture, doors and windows, bakery goods and mineral waters. In the financial area, a Development of Industries Board was established in 1949 to serve the credit needs of wholly-owned African enterprises. The scheme was understaffed and operated on a modest scale. Indeed, over a 16 year period, only 44 loans were made to small scale manufacturing firms. Finally, it should be noted that in 1967 a Small Scale Industries Division was established within the Ministry of Trade and Industry, but is operated with a very small staff and budget.

<sup>4/</sup> In 1965, for example, the dyes used as inputs by the small scale gara dyeing industry were subject to a 36.5 percent duty while the duty on the sewing machines used by the tailors was 15 percent [Government of Sierra Leone, 1967, p. 250].

the subsidized facilities were to be made available only to large scale industrial establishments.

Since 1972, however, when the promotion of small scale industry became an important element of the Government's industrial strategy, the Government of Sierra Leone has been attempting to develop effective policies for the small scale establishments. A major element in the strategy was the establishment in 1974 of the Credit Guarantee Fund, which was designed "to assist the small entrepreneurs in the country and facilitate the channelling of increased credit from the commercial banks to this category of borrowers" [Government of Sierra Leone, 1974-a, p. 5]. Under this scheme, the Bank of Sierra Leone was to guarantee loans made by the commercial banks and the National Development Bank to small private sector establishments.<sup>5/</sup>

The Government recognized, however, that the provision of credit was not necessarily the panacea for the development of small scale industry. Indeed, it recognized that other direct measures such as specific managerial and technical training schemes or marketing and raw material assistance might be needed. As the Finance Minister noted in his 1974 Budget Speech, "the best way of producing those services is now under the consideration of the Government and will in due course form an integral part of the scheme" [Government of Sierra Leone, 1974-a, p. 6].

In addition to assessing the efficacy of these direct methods of promoting small scale industry, however, the Government will also need information relating to the effectiveness of various indirect methods that might be used for this purpose. More specifically, the Government will need to

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<sup>5/</sup> The extent of the guarantee is 66.66 percent of the amount in default in the guaranteed account, subject to a maximum ceiling limit, ranging between Le 5,000 and Le 40,000. Le 250,000 has been set aside by the Bank of Sierra Leone for this purpose (1 Le (Leone) = \$1.20 U.S.).

assess the effects of alternative agricultural, tax and pricing policies on the performance of small scale industrial sectors. It will need to understand, for example, how variations in factor prices affect the substitution of labor for capital by these firms. Moreover, the Government will need to determine how the provision of expanded transport and public utility services will influence the small scale industrial sector, particularly that portion located in the rural areas.

At the present time, however, the data required to ascertain what policies will be effective for promoting the development of small scale industries in Sierra Leone do not exist. The only statistics relating to the industrial sector are for "large scale" firms and even these data are incomplete.<sup>6/</sup> There are no data on small scale industries in either the urban or rural areas and no studies, even on a sample basis of the entrepreneurs themselves. Thus, it is envisaged that the data generated in the present study will not only fill a serious statistical lacuna, but will also be of value to those charged with formulating effective industrial policies for Sierra Leone and indeed for other African countries.

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<sup>6/</sup>"Small scale" is ambiguously defined in Sierra Leone. The Ministry of Labor provides employment data only for "large" firms employing six or more persons. In 1966/67, a Census of Establishments was undertaken by the Central Statistics Office [Government of Sierra Leone, 1970]; but detailed information was only obtained from "large scale" firms, defined as those firms with annual returns greater than Le 5,000.

### Research Scope

The primary focus of this research effort is on rural small scale industries in Sierra Leone. Since the phrase "rural small scale industry" is subject to some ambiguity, however, the individual terms in the phrase must be defined before proceeding.

The term "industry", for example, is vague and is sometimes applied to a wide range of activities. In the present study, however, the term "industry" refers to those establishments that specifically engage in the production and repair of "manufactured goods".<sup>7/</sup> Thus, mining, construction, trading, transport, financial, social and personal services (except for repairing) are excluded from the present study. The activities included in the present definition, however, generate the largest amount of nonfarm employment within the rural nonfarm sector. The next most important rural nonfarm activity, apart from mining, is trading, a subject that will be covered in a separate study by D. Byerlee.<sup>8/</sup> Finally, it should be noted that the agricultural processing activities, particularly the processing of rice and palm oil, are also not included in the present study, but will be analyzed by I. May-Parker in a separate processing study.

Another ambiguous term that must be defined is "small scale". Since a complete spectrum of firm sizes exists in any country, any definition creates a rather arbitrary dividing line between firms. The measure most

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<sup>7/</sup>The definition is consistent with virtually every study of small scale industry in Africa; see Liedholm [1973, pp. 6-8]. Specifically, the activities included under categories 3000 and 9510 of the new ISIC classifications are included in the analysis (or categories 200-300 under the old ISIC scheme).

<sup>8/</sup>In preliminary data collected in rural localities during phase I, "industry" accounted for 62 percent of rural nonfarm employment and "trading establishments" accounted for 35 percent (not including mining or government).

commonly used is the number of employees, but the dividing line chosen varies from country to country and extends from 5 to 500 employees.<sup>9/</sup> For the purpose of the present study, however, "small scale" has been defined to include those establishments employing less than 50 persons. This criterion was chosen because it appeared to provide a good dividing line between the indigenous and foreign-owned firms and because it would facilitate comparison with studies in Nigeria, which also use 50 employees as the dividing line between large and small. Nevertheless, since important variations in firm characteristics seemed to occur even within the range defined as "small scale", additional size divisions of firms were made within the small scale classification and were used wherever possible.<sup>10/</sup>

Finally, it is necessary to provide a working definition of "rural". As with size classifications, the distinction between rural and urban is arbitrary and may create an artificial grouping of firms. Moreover, the definitions of rural and urban areas vary widely from country to country.<sup>11/</sup> For reasons of simplicity and comparability with Nigeria, however, the present study has adopted the standard dividing line of rural and urban used by the United Nations, 20,000 inhabitants.<sup>12/</sup> Since the composition of small scale industry seemed to vary within the rural and urban classifica-

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<sup>9/</sup> For a discussion of the various definitions, see Staley and Morse [1965, p. 14] and Schadler [1968, p. 42]. Staley, for example, defines 1-9 as "very small" and 10-99 as "small".

<sup>10/</sup> Indeed, the following divisions were used: 1, 2-5, 6-9, 10-49 and 50+ employees.

<sup>11/</sup> In Ghana, the threshold size for an urban area is 5,000 inhabitants, while in Kenya and Nigeria the figures are 2,000 and 20,000 respectively [Rosser, 1973, p. 11].

<sup>12/</sup> Ideally, a rural-urban classification scheme based on the occupational structure, as well as population density, would be desirable; but unfortunately, the required data do not exist.

tions, however, further classifications by locality size were used.<sup>13/</sup> Finally, it should be noted that although the main focus of the present study is on "rural" small scale industry, small scale industries in the "urban" area are also being investigated. The reason for including urban industries within the purview of this study is that data on Sierra Leone's urban small scale industry do not exist and such data are needed to ascertain the differences between the linkages with the small scale industries in the "rural areas". With these definitions specified, it is now possible to discuss phase I of the project.

#### Procedure for Phase I Data Collection

In view of the paucity of data on rural small scale industry in Sierra Leone, the first task of the project was to generate the required statistics relating to this sector. In phase I of the data collection, a census of Sierra Leone's small scale industrial sector was undertaken to provide an estimate of the population of small scale industrial establishments in the entire country. Such an endeavor was unique because it represented one of the first attempts in Africa to estimate the total number of industrial enterprises in both the rural and urban areas of one country.<sup>14/</sup>

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<sup>13/</sup> The following classifications were used: enumeration areas--2,000-5,000; 5,000-20,000; 20,000-400,000; over 100,000.

<sup>14/</sup> The only comparable survey was the study of small scale industries in Ghana undertaken in 1963 [Ghana, 1965]. In Nigeria, the Industrial Research Unit of the University of Ife [Industrial Research Unit, 1972] has undertaken establishment enumeration in several states, but does not estimate establishments in smaller villages (below 2,000). For a description of other partial surveys, see Liedholm [1972, p. 6].

In view of budgetary and time limitations, however, it was not possible to undertake a complete enumeration of every industrial establishment in Sierra Leone. Thus, it was necessary to devise a stratified sampling procedure to obtain an estimate of the establishment population. Since previous empirical studies have revealed that both magnitude and composition of industrial activity varies with size of settlements,<sup>15/</sup> the stratification was based on locality size.

The following procedure was thus used to obtain an estimate of the total number of industrial establishments. First, a total establishment enumeration was undertaken in the 18 localities, including Freetown, with populations in excess of 5,000.<sup>16/</sup> Secondly, one-half of the twenty-four localities with 2,000-5,000 inhabitants were randomly selected for total establishment enumeration.<sup>17/</sup> Finally, it was necessary to obtain an estimate of the number of industrial establishments in the smallest census units, the "enumeration areas".<sup>18/</sup> To ensure consistency with the other micro-level components of the Sierra Leone research project, the twenty-four rural "enumeration areas" randomly selected for these studies were used for the small scale industrial component as well. Thus, a total count

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<sup>15/</sup> See Liedholm [1973, p. 4].

<sup>16/</sup> The 1963 population census of Sierra Leone used the term "locality" to refer to cities, towns and villages (see map, Figure 1, on page 24).

<sup>17/</sup> The only constraint imposed on the random selection procedure was that at least one locality had to be selected from each of the eight agricultural regions that were used as the sampling frame for choosing the "enumeration areas". This procedure was designed to ensure that localities representing all types of agricultural production conditions were included.

<sup>18/</sup> Each "enumeration area", which was an artificial grouping constructed by the Central Statistical Office for the 1963 population census, contains an estimated 200 families [Spencer, 1972, p. 8].

was made of every industrial establishment operating in these twenty-four enumeration areas.

In each of the localities and "enumeration areas" examined during phase I, the enumerators obtained the following information about each establishment:

- (a) the type of activity,
- (b) the number of workers, including the proprietor, hired workers and apprentices,
- (c) the type of workshop (whether temporary, mud or cement) and
- (d) the number and kind of machines used (whether power driven or manually powered).

These data were rather quickly obtained during the street-by-street enumeration undertaken in each of the selected localities or "enumeration areas". Fortunately, excellent cooperation was obtained from the local authorities in these areas, and, in most cases, they provided the enumerators with local personnel who assisted in locating the various establishments. Indeed, since most of the industrial establishments did not have signs and were often hidden behind other buildings, these local informants were vital in ensuring that an accurate enumeration of firms was obtained.

Finally, it should be noted that the phase I data were collected during the period from March to June, 1974--a period during which one might have expected a sizeable variation in the level of nonfarm activity. This variation would have been expected because the "wet" season in Sierra Leone normally begins in early May, at which time nonfarm activity would be hypothesized to decline as a result of the marked increase in the demand for farm labor for planting at that time. Fortunately, for the present study, the "wet" season in 1974 did not begin until the end of June, and thus the results of the phase I survey should provide a good estimate of the

population of rural small scale industrial establishments during a period when they would be expected to be reasonably active.

#### Preliminary Results of Phase I Data Collection

With the phase I data collection now virtually completed, it is now possible to summarize the salient findings. The number and size distribution of establishments by location will be examined first, followed by an examination of the categories of industrial activities and the composition of the factors of production used by these establishments.

One of the important findings of the phase I research is the discovery that the industrial sector in Sierra Leone is much more extensive than had been previously recognized. This result is apparent from Table 1, which portrays the distribution of industrial establishments and industrial employment by location and size. These preliminary figures from the phase I surveys reveal that in 1974 almost 47,000 industrial establishments employed approximately 87,000 individuals. The Government of Sierra Leone, on the other hand, had assumed that only 46,000 individuals would be employed in this sector in 1974.<sup>19/</sup> Thus, the phase I survey indicates that their industrial employment estimate should have been almost doubled.

The phase I surveys also reveal that the small scale industrial establishments dominated the industrial sector in terms of both the number of firms and total employment. As Table 1 indicates, for example, there were only 26 large scale establishments in Sierra Leone and those firms employed

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<sup>19/</sup> Government of Sierra Leone, 1974-b, p. 186.

Table 1. Sierra Leone: Distribution of Industrial Establishments by Location and Size, 1974

Location and Firm Size	Number of Establishments	Percent	Employment	Percent
<b>A. <u>Small scale industry</u></b>				
1. Rural enumeration areas <sup>a/</sup>	42,000	89.4	68,000	78.1
2. Localities with population from 2,000-4,999 <sup>b/</sup>	1,614	3.4	3,784	4.4
3. Localities with population from 5,000-20,000	983	2.1	2,680	3.1
4. Localities with population from 20,000-100,000 (Bo, Kenema, koidu)	960	2.0	3,321	3.8
5. Localities with population over 100,000 (Freetown)	1,391	3.0	4,903	5.6
<b>Total small scale</b>	<b>46,948</b>		<b>82,688</b>	
<b>B. <u>Large scale industry</u></b>				
<b>Total large scale</b>	<b>26</b>	<b>.1</b>	<b>4,388</b>	<b>5.0</b>
<b>Total large and small scale industry</b>	<b>46,974</b>	<b>100.0</b>	<b>87,076</b>	<b>100.0</b>

<sup>a/</sup> Preliminary estimate based on projection from preliminary data received from 24 sample enumeration areas.

<sup>b/</sup> The actual establishments and employment figures obtained was doubled since only half the localities in this size range were examined.

Source: Small scale industry data collected during phase I of small scale industry component of African Rural Employment Project, Njala University College. Data for large scale were obtained from employment lists of the Ministry of Labor for December, 1973, supplemented by data collected by the authors.

only 4,388 individuals.<sup>20/</sup> In those localities with populations in excess of 2,000, on the other hand, there were approximately 5,000 small scale industries employing approximately 15,000 individuals (see Table 1). Moreover, on the basis of preliminary returns from the 24 sample "enumeration areas", it was tentatively projected that there were approximately 42,000 small scale establishments employing 68,000 persons in all the rural "enumeration areas" of Sierra Leone.<sup>21/</sup> Thus, these results indicate that small scale establishments account for approximately 95 percent of employment in Sierra Leone's entire industrial sector.

Indeed, the data presented in Table 1 reveal that the average size of industrial establishments in Sierra Leone was quite small. The "average" industrial establishment in Sierra Leone, for example, employed only 1.9 workers.<sup>22/</sup> A closer examination of the data, however, revealed that the average size of industrial establishments was directly related to the firm's location. If only small scale industries were considered, for example, the "average" industrial establishment in the "enumeration areas" employed 1.6 persons, while in these rural localities with 2,000 to 5,000 inhabitants the "average" establishment employed 2.3 workers.<sup>23/</sup> Moreover,

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<sup>20/</sup> Data obtained from employment list of the Ministry of Labor for December, 1973 and supplemented by data on the five large scale firms not included on this list. Large scale refers to establishments employing 50 or more persons.

<sup>21/</sup> These estimates were obtained by multiplying the actual number of industrial establishments and industrial employment in each "enumeration area" by a figure reflecting the representation of that "enumeration area" in that particular agricultural region.

<sup>22/</sup> Computed from Table 1.

<sup>23/</sup> In those localities in excess of 2,000, the breakdown of establishment by firm size was as follows: 1,673 (33.8 percent) firms consisted of one person; 2,753 (55.6 percent) firms employed from 2-5 persons; 359 (7.2 percent) firms employed from 6-9 persons; 163 firms (3.3 percent) employed from 10-49 persons.

in Freetown, the largest urban locality, the "average" small scale industrial firm employed 3.5 workers.<sup>24/</sup>

These results reinforce the importance of stratifying the analysis by size of locality and, indeed, provides support for distinguishing between "rural" and "urban" small scale industries. Although any division between rural and urban is, by nature, arbitrary, 20,000 inhabitants, as noted earlier, was adopted as the dividing line in the present study. On the basis of the 1963 population census, only Bo and Freetown would be classified as "urban". Discussion with government officials and the results of the establishment enumeration themselves, however, revealed that two other localities, Koidu and Kenema, had grown rapidly since 1963 and by 1974 must have had populations in excess of 20,000.<sup>25/</sup> Thus, in the present study, Koidu and Kenema have been classified as "urban" and have been grouped with Bo for purposes of analysis and stratification.

The data presented in Table 1 reveal, however, that even if Bo, Kenema and Koidu are classified as "urban", almost 95 percent of the industrial establishments are located in rural rather than in the urban localities. Moreover, these rural establishments account for 85 percent of the employment in the industrial sector. Thus, industrial studies that fail to incorporate "rural" industrial establishments in their analyses are missing a most important component of economic activity.

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<sup>24/</sup> Kilby [1962, p. 8] reports that the "average" urban firm in Eastern Nigeria employed 2.7 workers, while Callaway [1967, p. 170] reports that the "average" firm in Ibadan employed 2.8 workers.

<sup>25/</sup> Bo, for example, which is estimated to have grown very little from its 1963 population of 26,613, had 273 individual establishments in 1974 while Kenema had 290 and Koidu had 428. All other localities outside of Freetown had less than 200 industrial establishments.

Additional insights into the nature of Sierra Leone's small scale industrial sector can be obtained from an examination of the composition of industrial activities undertaken in the country. Since the figures relating to the rural "enumeration areas" are still only preliminary estimates, however, the industrial structure of the "enumeration areas" will be presented and discussed separately from the industrial structure found in those localities with populations in excess of 2,000.

A detailed breakdown of the estimated distribution of small scale establishments by industrial activity in the "enumeration areas" is presented in Table 2. The data reveal that tailoring is clearly the most important small scale industrial activity undertaken in the rural "enumeration areas" of Sierra Leone, as it accounted for 31 percent of the small scale establishments and 29 percent of the employment in these areas. Mat making, blacksmithing, carpentry and spinning were the next most important activities undertaken in these areas. Indeed, over 84 percent of the small scale establishments were estimated to be engaged in one of these five activities, thus revealing that the industrial activity in the rural "enumeration areas" tended to be rather concentrated.

A somewhat different structure of industrial activity, on the other hand, is found in those localities with populations in excess of 2,000. These differences are revealed in Table 3, which presents a detailed breakdown of the distribution of establishments by industrial categories and size of locality in those localities with 2,000 or more inhabitants. One of the most striking results presented in this table is the even more dominant position that tailoring assumes in these localities. Indeed, 55 percent of the establishments and 46 percent of the industrial employment in localities with more than 2,000 inhabitants are engaged in tailoring.

Table 2. Sierra Leone: Preliminary Estimate of the Distribution of Small Scale Establishments and Employment by Industrial Categories in Enumeration Areas, 1974

I.S.I.C. <sup>a/</sup>		Total Number <sup>b/</sup>		Percentage	
		Estab- lishment	Employment	Estab- lishment	Employment
<u>31</u>	<u>Food</u>				
3117	Baking	1,500	3,000	3.6	4.4
<u>32</u>	<u>Textiles and wearing apparel</u>				
3211A	Spinning and weaving	4,000	6,000	9.5	8.8
3214	Mat making	8,000	9,000	19.0	13.2
3220	Tailoring	13,000	20,000	31.0	29.4
3240	Shoe making and repair	1,000	1,000	2.4	1.5
<u>33</u>	<u>Wood</u>				
3319	Carving	500	1,500	1.2	2.2
3320	Carpentry	5,000	11,500	11.9	17.0
<u>37-38</u>	<u>Metal</u>				
3720	Goldsmithing	1,500	2,500	3.6	3.7
3811	Blacksmithing	5,500	11,500	13.1	17.0
3909	Others <sup>c/</sup>	2,000	2,000	4.7	2.9
	Total	42,000	68,000	100.0	100.1

<sup>a/</sup> International Standard Industrial Classification.

<sup>b/</sup> Preliminary estimate based on projection from data obtained from the 24 sample "enumeration areas". The estimates were obtained by multiplying the actual number of industrial establishments and industrial employment in each "enumeration area" by figures reflecting the representation of that "enumeration area" in that particular agricultural region.

<sup>c/</sup> Other industries includes hammock making, basket making, bicycle repair and watch repair.

Source: Small scale industry data collected during phase I of small scale industry component of African Rural Employment Project, Njala University College.

Table 3. Sierra Leone: Distribution of Small Scale Establishments and Employment in Localities Exceeding 2,000 by Industrial Categories and Size of Localities, 1974

I.S.I.C. <sup>a/</sup>	Type of Activity	Localities 2,000-5,000		Localities 5,000-20,000		Localities 20,000-100,000 (Bo, Kenema, Koidu)		Localities Over 100,000 (Freetown)		Total		Percent of Total	
		Estab.	Empl.	Estab.	Empl.	Estab.	Empl.	Estab.	Empl.	Estab.	Empl.	Estab.	Empl.
<u>31</u> 3117	<u>Food</u> Baking	104	206	45	155	12	84	11	164	172	609	3.5	4.2
<u>32</u> 3211A	<u>Textiles and wearing apparel</u> Spinning and weaving	86	126	16	27	1	1	0	0	103	154	2.0	1.1
3211B	Gara dyeing	90	380	61	280	19	82	3	24	173	766	3.5	5.2
3220	Tailoring	782	1,508	546	1,290	567	1,522	816	2,380	2,711	6,700	54.8	45.6
3240	Shoe making and repair	16	18	22	35	23	36	81	131	142	220	2.9	1.5
<u>33</u> 3319	<u>Wood</u> Carving	24	76	5	23	3	14	3	4	35	117	0.7	0.8
3320	Carpentry	226	666	137	483	115	536	75	345	553	2,030	11.2	13.8
<u>37-38</u> 3720	<u>Metal</u> Goldsmithing	22	32	16	47	15	43	20	54	73	176	1.5	1.2
3811	Blacksmithing	74	180	32	70	10	39	12	37	128	326	2.6	2.2
3812	Welding and fitting	6	20	4	9	8	48	19	86	37	163	0.7	1.1
<u>951</u> 9512	<u>Repair services</u> Radio	10	12	8	17	18	41	20	61	56	131	1.1	0.9
9513	Vehicle	20	98	29	133	51	578	66	578	166	1,337	3.4	9.4
9514	Watch	10	16	18	26	25	36	56	76	109	154	2.2	1.1
3909	Others	144	446	44	85	93	261	209	963	490	1,755	9.9	11.9
Total		1,614	3,784	983	2,680	960	3,321	1,391	4,903	4,948	14,688	100.0	100.0

<sup>a/</sup> International Standard Industrial Classification.

Source: Data were collected during phase I of the small scale industry component of African Rural Employment Project, Njala University College.

Moreover, the data reveal that tailoring is ubiquitous in Sierra Leone, being predominant in both rural and urban areas. Studies of small scale industry in other African countries and elsewhere, of course, have revealed that tailoring is consistently the single most important small scale industrial activity.<sup>26/</sup> What is striking, however, about tailoring in Sierra Leone is the magnitude of the domination of this industry; indeed, in no other African country does tailoring appear to be as dominant as in Sierra Leone. Carpentry, in which 11 percent of the establishments are engaged, is the next most important activity in these localities, followed by gara (local cloth) dyeing (3.5 percent), baking (3.5 percent), vehicle repairs (3.4 percent) and blacksmithing (2.6 percent).

These findings thus indicate that the composition of industrial activity varies with the size and location of settlements in Sierra Leone. The more "traditional" crafts, for example, such as mat making, weaving and blacksmithing are relatively much more important in the rural "enumeration areas" than in urban Freetown. The more "modern" activities, such as tailoring, vehicle repair, shoe making and metal welding, on the other hand, are relatively much more important in urban Freetown than in the rural "enumeration areas" or localities (see Tables 1 and 2). These results thus reinforce the importance of distinguishing between rural and urban small scale industries and point to the dangers of making predictions about rural industries on the basis of urban industrial surveys alone.

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<sup>26/</sup> For a review of these studies, see Liedholm [1973, p. 8]. Typical examples of the position of tailoring are found in the studies of rural Western Nigeria [I.L.O., 1970, pp. 187-188] and Eastern Nigeria [Kilby, 1962, p. 6] where tailoring is the number one activity and where 32 percent of the firms are engaged in this activity. The highest percentage found elsewhere known to the authors is urban Western Nigeria, where 51 percent of the firms engage in tailoring [Industrial Research Unit, 1972, p. 41].

Finally, when the composition of small scale industrial activity in the localities of Sierra Leone is compared with that found in other countries, a few additional characteristics of Sierra Leone's small scale industrial sectors emerge. Gara dyeing and baking, for example, are two activities, apart from tailoring, that are relatively much more important in Sierra Leone than elsewhere.<sup>27/</sup> Shoe making and bicycle repairing, on the other hand, are relatively less important in Sierra Leone.<sup>28/</sup> The complete explanation for Sierra Leone's particular structure of small scale industry, however, must await further study.

The phase I data also provide some insights into the composition of the factors of production employed by Sierra Leone's small scale industries. Since the factor data are not yet available for the establishments in the rural "enumeration areas", however, the discussion, of necessity, must focus solely on those establishments in the various localities of Sierra Leone. The labor component will be discussed first, followed by a discussion of the capital component and the composition of capital and labor.

The labor used by the small scale entrepreneur consists of his own or family labor, paid employees and apprentices. In the small scale industrial establishments in Sierra Leone, the apprentices represent the largest component of the labor used by the firms in those localities with 2,000 or more inhabitants. Indeed, apprentices accounted for 42 percent of the labor used, while paid employees and proprietors accounted for 17 and 41 percent

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<sup>27/</sup> Dyeing and baking generally represent less than 1 percent of the industrial establishments in most other countries. In Western Nigeria, for example, only .6 percent of the establishments were bakeries and .2 percent were dyers [Industrial Research Unit, 1972, p. XIX].

<sup>28/</sup> Shoe making and repairing represented 6.4 percent of the establishments and bicycle repair represented 4.5 percent of the establishments in Eastern Nigeria [Kilby, 1962, p. 6].

respectively. The use of apprentices in Sierra Leone appears to be somewhat less widespread, however, than in other African countries. In rural Western Nigeria, for example, over 56 percent of the small scale industrial labor (including proprietors) consisted of apprentices [I.L.O., 1970, p. 87]. The reasons for the relative unimportance of apprentices in Sierra Leone, particularly in view of the nonformal educational services it provides, must be further studied.

The relative importance of the use of apprentices, however, does vary markedly from industry to industry. The highest percentage of apprentices is found in such industries as vehicle repair (53 percent) and carpentry (58 percent), while correspondingly smaller percentages are found in such industries as tailoring (42 percent), blacksmithing (37 percent), garment dyeing (31 percent) and baking (17 percent). Finally, it should be noted that the use of apprentices varies by size of locality. In urban Freetown, for example, 45 percent of the labor used were apprentices while in rural localities with 2,000 to 5,000 inhabitants, the percentage declined to 36 percent. The rural-urban distinction once again thus proved to be important.

The amount of physical capital used by the small scale industrial establishments in Sierra Leone provided to be quite small. Data collected during phase I of the study reveal that 63 percent of the small scale establishments possessed at least one machine. The use of machinery was concentrated, however, in the tailoring industry, because virtually every establishment in that particular industry possessed at least one sewing machine. Since 55 percent of the industrial establishments were engaged in tailoring, it is clear that the use of machines elsewhere was indeed minimal. Moreover, the majority of machines used by this sector was manually powered.

In those establishments in localities with 2,000 or more inhabitants, 16 percent were power driven and 84 percent were manually powered.

Finally, it should be noted that the use of machines was less widespread in the rural than in the urban areas. In urban Freetown, for example, 57 percent of the establishments used machines while in those rural localities with 2,000 to 5,000 inhabitants only 48 percent of the establishments used machines. Indeed, it should be further noted that none of the establishments in these smaller rural localities used any power-driven machines. In these rural areas, it will thus be important to ascertain whether the lack of power is an effective constraint on an expansion of small scale industries.

One of the key questions from an economic point of view, however, is the efficiency with which these small scale industrial establishments combine the labor and capital inputs. At this time, only a minor fraction of the data necessary to answer this question is available. The data that do exist, however, indicate that the capital-labor ratio of the small scale industrial establishments in Sierra Leone is substantially below that of the larger establishments. Phase I data from the 89 small scale tailoring firms in Makeni, a rural locality, indicate that the capital-labor ratio for tailoring amounted to Le 76 per worker.<sup>29/</sup> The corresponding figure for large scale establishments in Sierra Leone was Le 5,813 per worker.<sup>30/</sup>

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<sup>29/</sup> Computed by assigning a value of Le 125 to each manually-powered sewing machine and a value of Le 50 to each power-driven sewing machine and dividing by the number of workers. These were "average values" for such used machines in Sierra Leone.

<sup>30/</sup> Computed from data in [Government of Sierra Leone, 1970, p. 76]. The original value of machinery, equipment and vehicles for all large scale business establishments (defined by Central Statistics Office as those establishments with annual returns of Le 5,000 or more) was divided by the number of persons engaged by these establishments.

These results indicate that the small scale industrial firms make intensive use of the apparent abundant factor, labor and less use of the apparent scarce factor, capital. A more definitive assessment of the effectiveness with which the small scale industrial establishments used these resources, however, must await the more detailed data that are to be collected during phase II of this project.

#### Procedure for Phase II Data Collection

The purpose of phase II, which began August 1, 1974, was to generate more detailed information from a selected sample of small scale industrial establishments over a one year period. These data were required for the various statistical analyses that were to be undertaken to determine the key structural parameters of the small scale industrial sector and the intersectoral linkages that unite this sector with the other parts of the economy.

A two stage (cluster) sampling procedure was used in selecting the firms that were to be subjected to more detailed enumeration. The first stage involved choosing a sample of localities and "enumeration areas", while the second stage involved choosing a sample of establishments for more detailed enumeration from within these selected localities and "enumeration areas". This two stage sampling procedure was used because, by minimizing the enumerators' interviewing and transport time, it generated the maximum coverage of firms from the limited number of enumerators available for the study. In the following section, the sampling procedure used in the various rural and urban "localities" will be discussed first, followed by a discussion of the procedure used in the "enumeration areas".

The first task was thus to establish a criterion for selecting those localities in which the detailed establishment enumeration would be undertaken. In order to maintain and preserve the linkages between the various portions of the Sierra Leone study, the criterion adopted was to choose those localities that serviced the twenty-four random selected "enumeration areas". As a working definition, a locality was then defined to "service" an "enumeration area" if the inhabitants of the "enumeration area" purchased any of their goods and services in that particular locality. On the basis of the preliminary returns from the rural consumption portion of the overall study, it was subsequently determined that the following thirteen localities serviced at least one enumeration area: three "urban" localities (Freetown, Bo, Kenema); three "rural" localities with populations from 5,000 to 20,000 (Makeni, Port Loko, Segbwema) and seven "rural" localities with populations from 2,000 to 5,000 (Rotifunk, Pendembu, Pujehun, Matru, Kabala, Kamakwie, Rokupr). Koidu was also added to the sample, however, because of the large number of small scale industrial establishments in that locality (see map, Figure 1).<sup>31/</sup>

To cover the establishments in these fourteen localities, eighteen enumerators were available on a half-time basis.<sup>32/</sup> Instead of adding four more localities, however, the four remaining enumerators were assigned to

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<sup>31/</sup> The reason that Koidu serviced none of the "enumeration areas" was that no "enumeration areas" had been selected from the Kono District, in which Koidu is located. The reason Kono District had been excluded from the analysis was the concern that data collection would be difficult. There was no difficulty experienced, however, in obtaining data on industrial establishments.

<sup>32/</sup> The nine enumerators originally assigned to this study on a full-time basis were combined with the nine enumerators assigned to the marketing portion of the study so as to increase the coverage of localities that could be included in the analysis. Thus, nine full-time or eighteen half-time enumerators were available for the small scale industry portion of the study.

Figure 1. Sierra Leone: Phase II Localities



the four largest localities that serviced an enumeration area. Thus, Freetown, Bo, Kenema and Makeni were assigned two enumerators while the remaining localities were assigned one enumerator.

On the basis of the results obtained when the questionnaires were pretested, it was discovered that one full-time enumerator could interview a total of thirty establishments per week.<sup>33/</sup> Thus, a total of 270 establishments could be interviewed in depth in these localities by the nine full-time equivalent enumerators assigned to the small scale industry study.

The next task was to establish criteria for selecting the particular establishments that would be enumerated in each of the fourteen selected localities. The sampling procedure, however, needed to satisfy two separate objectives. First, for the purpose of generalizing about the nature of the entire small scale industrial sector, it had to provide a reasonable representation of the underlying population of establishments in Sierra Leone. Secondly, it had to provide data on the complete spectrum of techniques of production utilized by the five small scale industries that were to be studied in greater depth.<sup>34/</sup> Since in some industries, only one firm was using a given technique of production, even a stratified sampling procedure would not satisfy both objectives. Thus, it was necessary to undertake two separate sampling exercises during the second stage of sampling.

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<sup>33/</sup> Each enumerator could interview ten firms per day; since interviews were to be conducted twice weekly during a six day work week, thirty firms could be interviewed per week.

<sup>34/</sup> These industries are tailoring, carpentry, gara dyeing, baking and blacksmithing ( accounting for over 80 percent of the employment in the rural localities of Sierra Leone).

To ensure that a portion of the firms selected in these localities would provide a reasonable "representation" of the underlying population of small scale industrial establishments in Sierra Leone, it was decided that two-thirds of the establishments chosen in each locality would be selected on a completely random basis. On this basis, 70 firms, representing 3 percent of industrial establishments in all the "urban" localities, and 110 firms, representing 4 percent of the industrial establishments in all the "rural" localities of Sierra Leone, were randomly selected in the 10 "rural" localities. Fortunately, the characteristics of the 180 establishments selected in the random sample closely paralleled the underlying population of industrial establishments; thus, the random selection procedure did appear to produce a "representative sample" of the small scale industrial firms in Sierra Leone.

The remaining one-third of the establishments chosen in the fourteen localities, on the other hand, were selected on the basis of a more purposive sampling technique. The goal in this case was to obtain data reflecting the complete spectrum of techniques of production used in the most important rural small scale industries.

An examination of the phase I data and discussions with the Sierra Leone Government indicated that five rural industries were of sufficient importance to be studied in greater detail: tailoring, carpentry, garment dyeing, baking and blacksmithing.<sup>35/</sup> Tailoring, for example, dominated the rural industrial scene and was an activity in which extensive use was made of both electric and manually-powered machines. The next most important rural activity, carpentry, was also an industry in which the production

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<sup>35/</sup> These five industries accounted for over 80 percent of the employment in the rural localities of Sierra Leone (computed from Table 3).

techniques varied widely. The third industry to be studied in detail, garadyeing, appeared to possess somewhat lower variation in production techniques than the other industries, but was an industry in which the Government was deeply interested. Baking, the fourth industry to be examined, was also an important rural industry and one that exhibited wide variations in the techniques of production. Finally, the blacksmithing industry was chosen for more careful study not only because of its exhibited varying production techniques, but also because of the industry's potential for producing agricultural tools. A purposive sample containing 90 establishments was then selected from among the firms in these five industries in a fashion to ensure that the sample would contain the complete range of production techniques. The two separate sampling exercises thus yielded a total of 270 establishments that were to be enumerated in those localities with populations in excess of 2,000.

The sampling procedure used in the "enumeration areas", on the other hand, was less complicated than that used in the localities. To preserve the linkages with the other portions of the overall Sierra Leone project, for example, it was decided to select the establishments from each of those twenty-four "enumeration areas" that had previously been selected for analysis on a random basis. Moreover, since preliminary data collected in the "enumeration areas" indicated that approximately one-sixth of the farming and nonfarming households were primarily engaged in industrial activities and twenty farm households were currently being examined in the farm level study, it was decided that four industrial establishments within each of these twenty-four "enumeration areas" should be randomly selected for more detailed examination during phase II. In this case, a random selection procedure alone was felt to provide an adequate representation of industrial

activities in the "enumeration areas", because the phase I data revealed that there was very little variation in production techniques. Finally, it should be noted that the ninety-six industrial establishments selected for detailed examination in these "enumeration areas" were to be visited by the enumerators used in the farm level survey.

The data to be collected from the grand total of 366 industrial establishments that were to be enumerated during phase II were arranged on eight separate questionnaires. Three questionnaires were to be administered on a twice weekly basis, because the pretesting of the questionnaires had revealed that the proprietors rarely kept adequate records and that their recall of these particular flow items was short. A labor input questionnaire, for example, was designed to obtain information on the hours spent daily by the proprietor, family labor, hired labor and apprentices by sex in the industrial firm and elsewhere, as well as the wages paid in cash and in kind. In addition, an "other input" questionnaire was designed to obtain information on the daily quantity, value and source of inputs purchased by the firm. Finally, an "output" questionnaire was designed to obtain daily information on the quantity of output as well as quantity, value and destination of sales plus the proprietor's "other income". Once a month, on the other hand, a "financial questionnaire" was to be administered to yield data on the sources, quantities and value of borrowing and lending by the enterprise. Additionally, at the beginning and the end of the survey year, three inventory questionnaires were to be administered. These forms were designed to elicit information on: (1) the quantity and value of buildings, (2) the quantity, value and source of equipment (tools and machines) and (3) the quantity and value of the inventory of inputs and outputs. Finally, a detailed entrepreneurial questionnaire was to be administered once during

the year to elicit various information including the entrepreneur's age, education, ethnic origin, previous occupation, parent's occupations, sources of initial and present capital, apprenticeship system, perceived barriers to expansion and management constraints.<sup>36/</sup>

#### Proposed Analyses

The various data collected during the phase II surveys will then be subjected to statistical analyses suggested by the theoretical framework previously developed for the rural industrial study. Since this analytical framework has been outlined in an earlier paper [Liedholm, 1973], only those portions of the analysis focusing on the determinants of the demand for labor in rural small scale industries, a key objective of the project, will be discussed.<sup>37/</sup>

The demand for labor in rural small scale industries is, of course, a derived demand and is thus related to the demand for the products of the rural industrial sector. The demand for these products, however, depends importantly on the farmers' income. To measure this relationship, it will thus be necessary to calculate the farmers' income elasticity of demand for rurally produced industrial goods. Fortunately, these can be estimated from the basic data currently being generated by the rural consumption

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<sup>36/</sup> Copies of all these forms are available from the authors.

<sup>37/</sup> A model focusing on the rural household as both a producing and consuming unit is currently being developed that will yield insights into the supply of labor for the sector. In addition, the migration components of the overall project will also deal with labor supply considerations.

component of the overall project.<sup>38/</sup> Another important source of demand for rurally produced industrial goods, however, is that arising from the backward and forward linkages with the agricultural sector. To ascertain these linkages, it will be necessary to have knowledge of the relevant  $a_{ij}$  coefficients of an input-output table constructed for Sierra Leone. Fortunately, the phase II surveys will provide the input and output data that are required for constructing the input-output coefficients for rural industries. The final important source of demand for rural industrial goods is that generated by the urban and import sector, parameters that in the present study will be considered exogenous and thus will be independently estimated.

These various output demands are subsequently transformed into a demand for labor through the production function. The specification and estimation of the production functions for rural small scale industry thus also becomes an important element in the analysis. In the present study, production functions with various specifications will thus be estimated empirically. The fixed coefficient Leontief production function, for example, is the production specification employed in input-output analyses. Since one of the goals of the overall project is to construct an input-output table for the entire rural sector of Sierra Leone, production functions with this specification must be estimated for the various rural industries if a complete table is to be constructed. A crucial element in the Leontief production function is the assumption that a single process production function exists in each industry; thus, the fixed labor coefficients can easily

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<sup>38/</sup>An attempt will also be made to estimate the price elasticities of demand for these products. However, the price elasticities are difficult in practice to estimate and conclusive results may not be obtained.

be computed from the labor and output data provided in the phase II surveys. Once the coefficients have been computed inversion of the Leontief matrix and appropriate multiplications will then enable one to determine how employment in rural industry would be affected by an autonomous change in the demand for either agricultural or rural industrial output.

The results obtained from the input-output analysis based on the fixed coefficient production function, however, are dependent upon the validity of the assumption underlying the formulation. In this particular case, the prior specification of a single process, fixed coefficient production function is of crucial importance, because the possibility of factor or process substitution is thereby assumed away. If such substitution is possible, however, then relative factor prices also play an important role in influencing the demand for labor.

The factor or process substitution issue, thus, is of considerable importance and, indeed, has been the subject of much discussion and debate. Fortunately, there are various methods available for empirically estimating the extent of substitution and these methods will be employed in the present study.

A linear programming framework, for example, can be used to analyze the extent of possible process substitution by firms. Thus, in the present study an attempt will be made to determine if alternative activity (or process) rays can be constructed and analyzed for each of the five most important rural industries in Sierra Leone. The relevant input, output and technical data to be used in the analysis will be generated from the detailed phase II survey of the tailoring, carpentry, gara dyeing, baking and blacksmithing industries.

In addition to the linear programming analysis of production, there are also the various neoclassical formulations of the production function, formulations that can provide insights into industrial production relationships in general and the factor substitution issue in particular. The neoclassical production function most commonly subjected to empirical estimation has been the Cobb-Douglas function. Since this function can be used to determine the returns to scale, as well as the marginal product of the factors of production, it can provide useful insights into the nature of the industrial production relationship.<sup>39/</sup> Thus, the present study will use the labor, capital and value added data collected during phase II to estimate the parameters of Cobb-Douglas functions for each rural industry. Unfortunately, however, the Cobb-Douglas function, does not shed much light on the factor substitution issue, because one of its properties is that the elasticity of substitution ( $\sigma$ ) is always equal to one.

Thus, it would also appear desirable to fit the more general Constant Elasticity of Substitution (C.E.S.) production function to these same industrial data. A key property of this function is that the elasticity of substitution ( $\sigma$ ) can range from 0 to infinity, thus showing that both the Leontief fixed coefficient function, where  $\sigma = 0$ , and the Cobb-Douglas function, where  $\sigma = 1$ , are special cases of this more general function. Although several alternative procedures exist for estimating the parameters of this function, the following formulation appeared to yield the greatest

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<sup>39/</sup> The Cobb-Douglas is usually estimated in the following log linear form:  $\log V = \log A + a \log K + b \log L$  where V represents value added, A is a constant, K is capital and L is labor. The parameters "a" and "b" are unconstrained and their sum can be used to determine the returns to scale. The marginal product of labor, which can be computed by suitable manipulation, would be of use in determining the shadow price of labor and in assessing the applicability of the marginality conditions.

insights for the purpose of this study:

$$\log L = a + b \log Q - c \log (w/p)$$

where L is labor, a is a constant, Q is value added and w/p is the real wage in the rural industry.<sup>40/</sup> The estimated parameters, b and c, provide valuable insights into the determinants of the demand for labor. The coefficient, c, is a measure of the elasticity of substitution ( $\sigma$ ) and thus reveals the degree to which factors can be substituted for one another in production. Moreover, as Minasian [1961] has noted ( $-\sigma$ ), or  $-c$ , is the real wage elasticity of demand when output is held constant; thus, it indicates the percentage change in the demand for labor from a given percentage change in real wages. The coefficient b, on the other hand, is the elasticity of employment demand with respect to output when real wages are held constant; thus, this parameter measures the percentage change in demand of labor arising from a given percentage change in output.

The parameters of this production function, as well as the other functions, will be estimated with ordinary least squares techniques using the data generated during phase II. It is envisaged that cross section estimates of these functions will be derived for each of the rural small scale industries in Sierra Leone. Moreover, to ascertain if these functions vary seasonally, the production functions for several industries will be calculated using data grouped by quarters. Finally, to discover if the industrial production functions vary by location, separate production functions will be estimated for several industries grouped by location.

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<sup>40/</sup>For a discussion of the derivation of this formulation of the C.E.S. function, see Wallis [1973, p. 56-57]. It should be noted that this formulation assumes that the profit maximizing and other marginal conditions hold.

The previously described analyses, however, do not fully capture the important role played by the entrepreneur in the employment decision. The factors that determine the quantity and quality of entrepreneurial services that will be forthcoming in the rural small scale industrial sector, for example, will indirectly affect the demand for labor in that sector. By using the data collected from the entrepreneurial questionnaire of phase II, however, it should be possible to test some hypotheses concerning the factors that might be expected to affect entrepreneurial services. One might hypothesize, for example, that the lack of technical or managerial skills has an adverse effect on the quantity and quality of entrepreneurial performance. This hypothesis might then be verified by using Chi-square tests to ascertain if there were a correlation between the profit rate or the size of firm (proxies for success) and such categorical variables as the entrepreneur's education and training, previous occupation and accounting system. Similarly to attempt to ascertain whether or not the lack of access to capital had an effect on entrepreneurial performance, one might, for example, seek to determine if there were a relationship between the profit rates of firms in a particular small scale industry and the firms' initial levels of capital. If firms which started out with less initial capital were as "successful" as those firms with more initial capital, for example, it would provide some indication that the "shortage of capital" might not be a particularly serious entrepreneurial constraint. These examples, however, are simply illustrative of the types of analyses that will be undertaken to examine the factors, including those of a social and cultural nature, that might influence the quantity and quality of entrepreneurial services. When these results, as well as those from all the other previously described analyses are obtained, they should provide significant

insights into the major determinants of the demand for labor in the rural industrial sector of Sierra Leone.

#### Policy Relevance

The results generated by this study of rural small scale industry should thus prove to be of value to policy-makers in Sierra Leone and, indeed, in other African countries. They will provide, not only a descriptive profile of the scope and character of a relatively unknown component of the rural economy, but also a means of determining some of the employment effects of policies that are designed to influence either directly or indirectly the rural small scale industrial sector.

The effects of various wage policies on employment in the rural small scale industrial sector, for example, can be traced by using one of the statistical parameters obtained when estimating the C.E.S. production functions for these industries. Specifically, the estimate of the elasticity of substitution coefficient ( $\sigma$ ) for each industry will provide an approximate measure of the percentage change in employment resulting from a given percentage change in the real wage.<sup>41/</sup> Thus, if there were indeed factor market distortions that resulted in an unduly high relative labor price, the policy-makers could use these coefficients to estimate the extra employment in the rural small scale industrial sector that would be generated through their removal. Correspondingly, these coefficients could also be used to estimate the employment consequences of failing to restrain real wage increases.

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<sup>41/</sup> See footnote "40", page 33. More precisely, it is the negative value of this coefficient that is relevant.

The statistical parameters generated in this study will also assist policy-makers in measuring how alternative agricultural policies might differentially affect employment in rural small scale industries. An agricultural policy, for example, that increased the income of a large number of low income farmers, who might be hypothesized to possess a relatively high income elasticity of demand for rurally-produced industrial goods, might generate more rural industrial employment than an agricultural policy that benefitted only a smaller number of high income farmers, who might be hypothesized to possess a high income elasticity of demand for imported goods. By combining the estimates of these various agricultural groups' income elasticities of demand for rurally-produced industrial goods (estimates derived from the rural consumption study), the estimates of the input-output coefficients between agriculture and rural industry and the production function estimates for the various rural industries, the differential and employment effects of these alternative policies can be measured and thus be incorporated into the policy-maker's decision framework.

In addition to providing a measure of the effects of these more indirect policies, however, the results of the study can provide policy-makers with insights on the effectiveness of those policy measures that are directly designed to influence employment in the rural small scale industrial sector. The majority of the information useful for this purpose will be derived from the previously described analyses of entrepreneurial performance. The results of the analysis of the importance of technical and managerial skills in determining entrepreneurial performance, for example, can provide an indication of the efficacy of various training schemes in expanding small scale industry employment. Correspondingly, the results of the analysis of the relationship between capital and entrepreneurial success can provide

insights into the potential effectiveness of credit schemes that might be specifically designed for this sector. These examples, however, are only illustrative of the kinds of analyses that would provide useful insights for policy-makers.

It should be noted in conclusion, however, that the rural small scale industry study can also assist policy-makers simply by providing descriptive information about the extent and composition of this sector. To cite an example, the Sierra Leone Government recently received several large orders for gara cloth from a number of foreign countries, but has been unable to locate sufficient quantities of the materials to satisfy this demand. One of the reasons for the Government's difficulty in the area is that it does not know where most of the widely dispersed gara dyeing establishments are located. Thus, by providing this basic information, the project will be able to assist directly the Government in expanding employment opportunities in the rural small scale industrial sector of Sierra Leone.

#### Summary

The empirical evidence generated by the study has revealed that the small scale industrial sector in Sierra Leone is extensive, both in terms of the number of establishments and employment. The average size of these establishments is small, 1.9 workers per establishment and the vast majority (95 percent) are located in the rural areas. Tailoring is by far the most important activity, followed by carpentry, gara dyeing and baking. The composition of activities varies importantly by location, thus rein-

forcing the importance of distinguishing between industries in the urban and rural areas.

To obtain even more detailed information on the sector, however, a sample of 366 industrial establishments is being enumerated twice weekly for a period of one year. The data generated will be subjected to various statistical analyses to determine the key structural parameters of the rural small scale industrial sector and the intersectoral linkages that unite this sector with the other parts of the economy. As a result, the major determinants of the demand for labor in rural small scale industry will be identified and examined. The results generated by the study should thus prove to be of value to policy-makers charged with developing effective strategies and policies for expanding employment in the rural areas of Sierra Leone and other African countries.

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