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Chuta,E.J.

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A RESEARCH PROPOSAL TO STUDY SMALL-SCALE INDUSTRIES IN RURAL AREAS OF SIERRA LEONE

BY

E. J. Chuta

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MICHIGAN STATE UNIVERSITY
AFRICAN RURAL EMPLOYMENT PROJECT
DEPARTMENT OF AGRICULTURAL ECONOMICS
EAST LANSING, MI 48823

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Introduction

In most parts of Africa, unemployment problems have become so acute that policy makers are developing appropriate strategies and policies for generating rural employment and averting the trend of migration into the cities. These official policies are crucial even in the face of a lacuna or paucity of information with respect to rural small-scale industries in particular countries. However, recently much reliance is being placed by African governments on reliable data as a guide for policy. In this, Sierra Leone is no exception. The research in rural small-scale industries in Sierra Leone will supply information with respect to the missing link between the rural and urban sectors on the one hand and between the rural farm and nonfarm subsectors on the other hand. The understanding of such intersectoral and intrasectoral relationships is a necessary first step in analysing the unemployment situation and making prescriptions as to what will be an appropriate policy action.

Research Objectives

1.) The objectives that relate to the static aspect of the study are the following:

   a.) To estimate the number and kinds of small-scale industries in rural and urban areas of Sierra Leone;

   b.) To identify the present state of factor proportions and factor returns in those small-scale industries in order to find out what technological alternatives exist; and

   c.) To estimate the supply response of those industries at different product prices.

2.) On the dynamic aspect of the study, the following specific objectives will be pursued:

   a.) To estimate rural income elasticities of the major products of those industries as well as for urban produced and imported goods;

   b.) To determine what potential there is for employment in the rural small-scale industries;

   c.) To explore the kinds and extent of linkages between the small-scale industries in the rural and urban areas on the one hand, and the output and employment linkages between rural small-scale industries and agriculture on the other hand.

3.) On the policy side, attempts will be made:

   a.) To identify the problems of small-scale industries; and

   b.) To recommend policies to meet those problems.

Hypothesis to be Tested

1.) Rural small-scale industries are essentially labor intensive. Connected with this hypothesis is that there exists a substantial amount of labor that can be potentially utilized in rural small-scale industries. Because capital-labor ratio in such industries is small, an increase in the number of such establishments will involve increased employment with little capital investment.

2.) Products of small-scale industries in the rural areas of Sierra Leone have positive income elasticity of demand. Quite the contrary, Hymer and Resnick[1] have postulated that the traded products of the rural small-scale industries (called z-goods) are inferior goods so that as rural incomes increased, urban produced and foreign imported goods are substituted for the products of rural small-scale industries. As a result, over time such rural industries decline.

3.) There exists strong linkages between agricultural production, income and employment and rural small-scale industries. Liedholm[2] [p.14] has emphasized that the future size of the rural industrial sector would depend very much on the future growth of the agricultural sector (backward and forward agricultural linkages). Gibbs[3] [p.11] pointed out that the output effects of agricultural productivity will lead to changes in employment in agro-industries so that there is a "basic correlation" between the growth of the farm sector and the rural nonfarm sector.

4.) Growth of rural small-scale industries is limited by shortage of managerial skills, capital and lack of education.

Methodology

From the data that will be gathered for the small-scale industries, a representative firm will be constructed for each major small-scale industry. In doing this many variables will be taken into account. For example, age of the entrepreneur, education, initial capital, number of workers employed, and rate of profits are factors to be considered to ensure that the representative firm typifies a set of homogenous situations common to a given group of firms.

On the supply side of the analysis, a one-year period linear programming model will be applied to each representative firm. It will be assumed that each representative firm as a decision-making unit maximises profits. The model will consist of three components- the objective function, the activity set and the constraint structure. If written in a more compact form, each representative firm model will:

$$\text{Maximize} \quad Z = \sum_{j=1}^{n} C_j \; X_j \qquad j = 1, 2, \ldots n$$

$$\text{s.t.} \quad \sum_{j=1}^{n} AX_j \leq B$$

and $X_i \geq 0$ where

Z = profits or net cash returns

C_j = vector of prices/costs/rate of interest, etc.

X_j = vector of activities

A = $m \times n$ matrix of technical coeffieicnts

B = $m \times 1$ vector of available resources (assuming m available resources)

Activities

In specifying activity set for each enterprise attempts will be made to identify and include different processes and technological alternatives.

The following activities will be included:

1.) Production activities (farm and nonfarm), sales of output, purchase of variable inputs;

2.) labor hiring and selling valued at opportunity cost for unskilled labor and wage rate for skilled labor;

3.) investment-disinvestment entered at acquisition price of new assets and salvage value of existing ones; and

4.) financial activities---made up of savings, borrowing and debt repayment.

Constraint Structure

Whereas the representative firms would be defined by one of the variables mentioned earlier, resource restrictions for these firms would be the averages of the resources used by the firms that

constitute a homogeneous group from which the representative firm was constructed. For this reason, a thorough inventory of resources used by the firms will have to be taken.

The major resources will be land (in the case of farm enterprise), labor, machinery and cash. Land will be measured in acres and labor preferably in man-hours. In incorporating machinery capacity and other capital expenditures into the LP model, flows of services generated from the stocks of machinery will be entered on a one-year basis and measured in machine-hours. With respect to cash, a distinction will be made between working capital and borrowings at various rates of interest. Working capital will be made up of cash generated from sales, savings, farm income less costs of inputs, consumption and debt repayment. The limits of borrowable funds could be determined by the amount of security the farmer has to offer and the extent of government guarantee on funds borrowable for investment.

Results Expected from LP Model

The LP model is expected to give information with respect to how the representative firms allocate resources to farm and nonfarm activities and leisure. It will throw light on what sector remunerations are in different enterprises. Within the model, it will be possible to carry out some sensitivity analysis. For example, by altering product prices we could derive the *ceteris paribus* supply response; by varying input prices, we could obtain also the *ceteris paribus* derived demand

for that input; we could vary labor and capital costs within a rural nonfarm enterprise to generate a short term factor substitution possibility; finally by varying a set of farm prices relative to nonfarm prices we could trace a production frontier. Finally, it is hoped that the representative firm models will permit the development of a macro-model to trace interregional flow of resources in response to changes in certain policy variables.

On the demand side of the study, ordinary least square multiple regression technique will be employed to derive the demand functions for different categories of items. Very close attention will be paid to rural demand elasticities for urban produced, rural produced and imported categories of food items, durables and intermediate goods. From the regression analysis, it will be possible to obtain elasticity coefficients that will enable us to project into the future (say, 1984) what regional demand situations would be for certain commodities and therefore what supply conditions will be necessary to match the demand.

In analysing the data on rural entrepreneurship, attempt will be made to find out the effects of certain variables on business success. Rate of profits or output could be used as proxy for the dependent variable. Initial capital, level of education, age of operator, etc., could be used as explanatory variables. In this regard, the Chi-Squared test will be employed to test the dependence of the dependent variables on each of the explanatory variables.

Sources and Types of Data[4]

Mostly primary data will be used in this research. The primary data will be generated from a country-wide survey that would start in January, 1974 in Sierra Leone. A two staged-sampling procedure will be used. The first stage will involve an estimate of the population of small-scale industries in rural Sierra Leone. A procedure of stratified sampling on the basis of size of localities will be followed. However, to ensure that rural and urban linkages are explored, small-scale industries in two urban areas, Bo and Freetown, will be completely enumerated. The table below shows the sampling units that will be covered.

Enumeration Areas	Larger Rural Localities	Bo and Freetown
a. All enumeration areas covered in farm production, marketing and migration studies	a. 5 percent of the 312 localities with populations 500-1,000 (16)	(complete survey)
b. 5 percent of all other enumeration areas	b. 10 percent of the 148 localities with populations from 1,000-5,000 (15)	
	c. 50 percent of the 16 localities with populations from 5,000-20,000 (8)	

At this stage of survey, enumerators will be required to obtain information for each establishment on types of activity, number of workers, type of workshop and number of machines used.

In the second stage of the survey, a stratified random sample will be drawn from the list of establishments enumerated in the first survey stage. Information on value, quantity of inputs and outputs, types of activity, sources of input, value and quantity of capital assets will be gathered. In collecting data, different classifications of rural industries have to be borne in mind. Classification of rural industries by market orientation or degree of specialization or degree of capitalization will throw light on future prospects of survival of such industries. Disaggregation according to ownership patterns---partnerships, cooperatives, family business, individually operated---will indicate the organizational structure that will likely attract government assistance. Information will be gathered on the educational background of entrepreneurs. Attempts will be made to collect information on problems faced by small industries in the rural areas. Stober[5] has a list of problems that small businesses face in Sierra Leone. The list includes scarcity of indigenous entrepreneurship, shortage of managerial and technical knowhow, lack of industrial advisory services, competition of alien entrepreneurs, smallness of the market and lack of access to capital and collateral security. However, this survey was mostly urbanbased. It is very likely that a survey of rural small-scale industries might spotlight new kinds of problems. An effort will be made to extract from official sources information regarding the impact of the small industries division of the Ministry of Trade and Industry on small industries particularly those in the rural area. The role of public policies in regard to public works, industrialization, entrepreneural training, village and community developments, direct state

participation in production and marketing will be examined.

Other Surveys

While the survey on rural small-scale industries is going on, farm management and production surveys will be underway in the same enumeration areas. From such surveys, it is hoped that input-output data will be assembled for the farm sector. Such data will be incorporated in our LP model as I mentioned before. Likewise the household consumption survey will be taking place at the same time and in the same enumeration areas used for the other surveys. In the consumption surveys, expenditure and income data will be collected and used to estimate income elasticities for rural income groups for food and nonfood items, produced locally, produced in the urban areas or imported from overseas. All these surveys will stretch over a period of one year.

Policy Relevance of the Research

The results of this research will be useful in development planning. First, the research will spotlight the key structural parameters of the nonfarm sector and how those parameters relate to the parameters of the farm sector. A knowledge of such structural relationships is necessary in order that planners will be able to trace employment, output and income distribution effects of policies undertaken in

the urban, rural farm and rural nonfarm sectors.

Secondly, income elasticity coefficients will give an idea of the demand prospects facing the products of the rural nonfarm activities. Thus policy measures could be used to encourage the growth of the industries whose income elasticity coefficients indicate that they would grow in the future.

Thirdly, a comparision of the cost structures and factor ratios of the same industries located both in the rural as well as urban areas will yield a hint as to whether certain industries are located in the right places.

Fourthly Chi-Square tests for business success will indicate which variables need to be emphasized in an effort to encourage local people to invest in particular rural industries. For example, if indeed cash availability is a constraint, then credit policy has to be resorted to for solving the cash problem of rural entrepreneurs. If tax policies adversely affect rural entrepreneurs, then this might call for a revision of them to encourage rural entrepreneurs.

Finally, on an individual farm level, our LP model will yield information that can be used by the small-industry division of the ministry of trade and industry to advise rural small-scale industry entrepreneurs on how best to allocate their resources and the most profitable lines of investment to undertake.

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