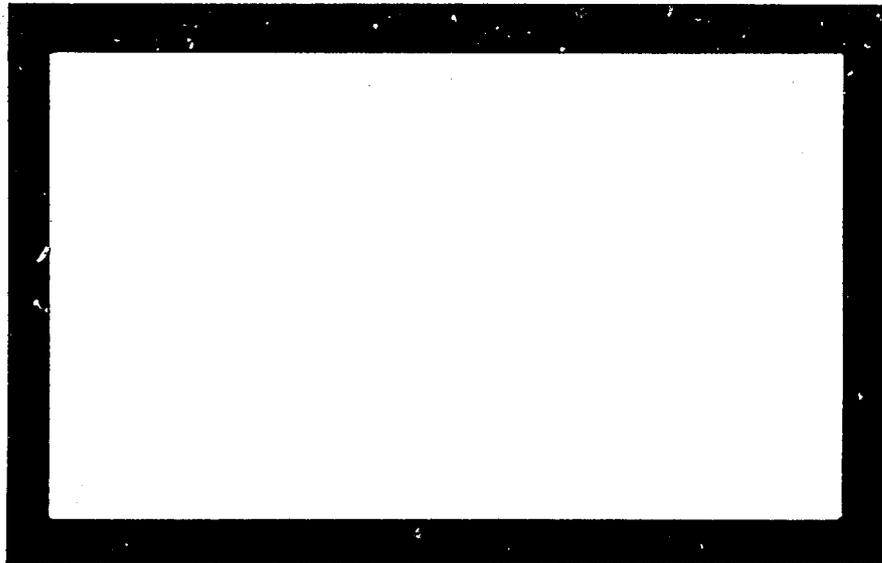


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9. ABSTRACT This paper reports on a study of the labor effects on farm families of an I.A.D.P. loan for developing inland swampland for rice production. The study was a small part of a national study of rural employment problems in Sierra Leone. One village, Benduma, in one of the three operational areas of the I.A.D. project was selected for intensive study of the daily work performed by males, females, and children in 23 selected households. From May, 1974 to June, 1975, interviews were conducted twice a week at selected households, and an input-output questionnaire was used to provide daily records of hours worked per family member and non-farm output, farm and non-farm sales, loans given and received, and gifts given and received. From this data were calculated household income by source and its distribution, labor utilization, returns to labor, and seasonal profiles of farm and non-farm enterprises. The author concludes that women worked slightly harder in the development project than women not participating in it, but that the increase in their work load was much less than the increase in the work load of adult males and children. Women play a substantial role in the cultivation of a "development" crop (swamp rice) using improved technology. However, the results of the study negate the hypothesis that such agricultural development projects place an uneven burden on women vis-vis men.		
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# AFRICAN RURAL ECONOMY PROGRAM

## WORKING PAPER



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**AFRICAN WOMEN IN AGRICULTURAL DEVELOPMENT:  
A CASE STUDY IN SIERRA LEONE**

by  
**Dunstan S. C. Spencer**

**Working Paper No. 11**

**April 1976**

## AFRICAN RURAL ECONOMY PROGRAM

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## 1. Introduction

Labor is the most important input into traditional agricultural production systems. In tropical Africa a significant proportion of this labor is provided by women [2]. Women play a major role in all but the most physically demanding tasks such as the brushing and felling of heavy trees. It is clear that they dominate in such activities as weeding of annual crops and food processing, but the extent to which women participate in different activities varies from country to country and area to area depending on farming systems, ethnic and other social and climatic factors. There is a growing body of literature on the economic role of women in rural development but with a few exceptions, notably Boserup [2], Clark [6], Achola Pala [17, 18] and Simmons [21], they are based on superficial observations with very little actual empirical evidence to support or test the hypotheses and generalizations presented. This lack of empirical evidence and the need to collect information in order to illuminate the role, status and contribution of women in developing countries has recently been highlighted in two seminars held in the United States [1, 28].

Many writers assert that agricultural development projects in Africa lead to an increase in women's work load while the work load of men is reduced [2, 22, 26]. The argument runs as follows: agricultural development projects introduce improved practices into farming systems such as improved seed, fertilizer, farm mechanization and irrigation. However, improved agricultural inputs are usually introduced by men, saving men's labor, while women are called on to increase their labor input in order to weed the expanded acreage and harvest and process the expanded output. In summary it is hypothesized that the work

load of men remains constant or is reduced while the work load of women is increased as agriculture becomes more commercialized.

The major objective of this paper is to provide an empirical test of this hypothesis using the Integrated Agricultural Development Project (I.A.D.P.) in the eastern province of the West African state of Sierra Leone. As usually stated above, the hypothesis does not distinguish between different types of projects and the types of technological development being fostered by the project. Following the Hicksian convention of economics we can distinguish between "labor-saving" mechanical technology designed to facilitate the substitution of other inputs for labor and "land-saving" biological and chemical technology designed to facilitate the substitution of other inputs for land [8, 9, 20]. It may be reasonable to expect that the effect of an agricultural development project on women's work would depend on (1) the degree to which the technological package is labor-saving or land-saving, (2) the degree to which the activities affected by the improved technology are traditionally performed by men or women and (3) the willingness of either sex to adopt the technology being introduced.

As described below the I.A.D.P. used in testing the hypotheses in this paper is basically a project fostering the introduction of land-saving biological and chemical technology. In a subsequent paper a test of the hypotheses using a project fostering labor-saving mechanical technology will be provided.

The Sierra Leone I.A.D.P.

The International Development Association (I.D.A.) and the Sierra Leone Government financed I.A.D.P. project was established in January 1973. The main objectives of the first phase (1973-1975) were to raise the standard of living of about 2,500 farm families in the eastern and parts of the southern provinces of Sierra Leone. The project has a large scale component, i.e., expansion of an already established government nucleus plantation and installation of a large palm oil mill. It also involves the planting of an additional 1,830 acres of oil palm in 10 acre small holder plantations around the nucleus plantation, 750 acres of small holder cocoa, as well as the development of 3 acre farms on 6,000 acres of inland valley swamps. Participating farmers receive credit, improved inputs such as seed and fertilizer and training in the operation of the improved systems. Since the three crop programs were all in the planting phase while one crop of rice had already been harvested at the start of the study reported here, this paper is restricted to a consideration of the inland swamp development component of the I.A.D.P.

Farmers participating in the inland swamp scheme are given a development loan of about Le70.00<sup>1/2</sup> per acre at 8 percent interest, which is payable in five annual installments starting at the end of the first year. The loan is disbursed partly in kind (tools and equipment) and partly in cash to cover the cost of labor needed for the very labor demanding tasks of bush clearing, bunding and digging of water channels as well as other land preparation activities. A seasonal loan of about Le1.00 = \$1.20 at time field work was being carried out.

L11.00 is also available on request every year in kind to cover the cost of improved seed, fertilizer and chemicals supplied. It is repayable at the end of harvest and bears an interest rate of 10 percent.

In addition to receiving credit, participating farmers also receive training and advice regarding the cultivation of the crop. Farmer training takes place in two ways. Some farmers go through a formal ten to fourteen day practical training course at the headquarters of the project. Most participating farmers did not receive training at the central school but received instruction on their own fields by the project's extension agents.

### 3. Methodology

Female labor is only one of several inputs into the inland swamp farming system. It could substitute for some inputs, e.g., male and child labor and is complementary to others. For a full understanding of the relationships it is necessary to measure not only the input of female labor into the farming system but also to measure the inputs of complementary and supplementary inputs as well as the resulting outputs. Within the limits of the resources available for this study, <sup>2/</sup> one village (Benduma) in one of the three operational areas of the I.A.D.P. was selected for intensive study. A listing of all households in the village was compiled in April 1974 and the following households randomly selected from the list for study: 7 of the 23 households which

<sup>2/</sup> One enumerator was available for collecting data. This study was a small part of a national study of rural employment problems in Sierra Leone.

had already participated in the scheme for one year, 7 of the 14 households who were joining for the first time and 9 of the 106 non-participant households.<sup>3/</sup>

A stock questionnaire was administered to all twenty-three households in April 1974, collecting information on the number and characteristics of household members, stocks of equipment, farm produce, livestock and tree crops in order to estimate the value of farm and nonfarm capital and labor stocks. Starting in May 1974 and continuing to June 1975 selected households were interviewed twice a week using an input-output questionnaire which provided daily records of hours worked per family member per enterprise, inputs purchased, labor hired and sold out, farm and non-farm output, farm and non-farm sales, loans given and received and gifts given and received.<sup>4/</sup> From this data we are able to calculate household income by source and its distribution, labor utilization and returns to labor as well as provide seasonal profiles of farm and non-farm enterprises. Other questionnaires were administered and direct measurements made during the survey year to provide information on acreage of fields, tenural status and costs of land improvement, crop yields, distances to fields by crop and changes in farming systems, information flows and constraints.

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<sup>3/</sup> Of the 143 households in Benduma, 5 were headed by women. Three of these households were participating in I.A.D.P. while only a fourth of the male-headed households were participating.

<sup>4/</sup> For a justification of the use of the cost-route method in collecting this type of data in Africa see Spencer [23], Norman [15], Tollens [27] and Kears [10, pp. 11-19].

In this paper the three groups of selected households<sup>5/</sup> are compared in terms of (a) their access to resources, (b) the distribution of work by enterprise and activity performed, (c) the seasonal distribution of the hours of work and (d) the total hours of work by adult males, adult females and male and female children in the household. The utilization of different types of hired labor is described and the wages earned by activity and by sex analyzed.

#### 4.1. Access to Resources

Table 1 presents stock type information on the three groups of households surveyed. The data show that the early participants in the project had a larger mean household size than the other groups. Dependency ratios were similar among the three different groups but non-participating (Group A) households had a lower sex ratio than the two groups of participants. Also the mean age of the household head was lower in the two groups of participating households than among the non-participating Group A. There was no difference in the years of formal education between groups. Group C participants had a mean of about 5 acres of plantation oil palm while none of the others had any. The oil palm was planted as part of a development scheme in the area before I.A.D.P. was implemented. The switch from upland rice to swamp rice farming is a feature of the I.A.D.P. Table 1 shows a decline in mean acreage of

<sup>5/</sup> Group A: Non-participants. No land development activities.  
Group B: First year of participation in I.A.D.P. Major land development activities.  
Group C: Second year of participation in I.A.D.P. Minor land development activities.

Table 1. Stock of Household Resources in Participating and Non-participating Rural Households in the I.A.D.P., Sierra Leone, May 1974.  
(Average Per Household)

Category	Household Group		
	A Non- Participants	B First Year	C Second Year
Household size			
Adult <sup>a/</sup> males	1.8	1.1	2.0
Adult females <sup>b/</sup>	1.8	1.9	3.1
Male children <sup>b/</sup>	0.3	0.1	1.0
Female children	0.1	0.3	0.3
Total people	5.1	5.3	9.3
Dependency ratio <sup>c/</sup>	0.53	0.49	0.54
Sex ratio <sup>d/</sup>	0.48	0.64	0.53
Age of household head (years)	55.8	46.0	43.4
Education of household head (years)	3.4	3.9	4.4
Investment in equipment			
Cost of farm equipment (Le.)	10.09	15.54	11.91
Cost of non-farm equip. (Le.)	8.92	17.82	29.06
Value of livestock (Le.)	4.26	3.17	3.29
Acreage of economic tree crops			
Oil palm	0.0	0.0	4.64
Others	1.63	0.73	0.23
Acreage of annual crops			
Upland rice	1.8	1.1	0.7
Swamp rice	0.3	2.5	3.0
Total farm acreage	3.73	4.33	8.57

<sup>a/</sup> Over fifteen years old.

<sup>b/</sup> Ten to fifteen years old.

<sup>c/</sup> Proportion of total household members that were under fifteen and over fifty-five years old.

<sup>d/</sup> Proportion of members over ten years who are female.

upland rice from 1.8 for Group A households to 0.7 for Group C and a rise in mean swamp acreage from 0.3 to 3.0. This switch in farming system has strong implications for labor utilization since swamp rice farming, even using traditional technology, is much more labor intensive, i.e., uses more labor per acre than upland rice farming [24]. In addition to this switch in farming system the I.A.D.P. is also encouraging the adoption of the land-saving biological and chemical technology of improved seed, fertilizer and water control. The net effect on household labor utilization is discussed later.

The stock information presented in Table 1 therefore indicate that the early participants in the project had a greater endowment of a crucial factor for inland swamp cultivation, family labor. They had more technical knowledge in the sense that they had previous experience with a development project as shown by their acreage of plantation oil palm. Non-participants had a mean family size of 5.1 while participants in the second year had a mean family size of 9.1. Also the head of household in the project was younger than the non-participating head of household.

#### 4.2. Distribution of Family Labor by Enterprise

Table 2 presents information on the distribution of non-domestic family labor among the different farm and non-farm enterprises and the breakdown of the labor input by age and sex. Excluded from the figures are purely domestic activities such as preparation of meals, child minding (when it is not performed in conjunction with non-domestic activities), personal hygiene, etc. Non-domestic activities are defined as all farm-

ing activities as well as non-farm activities such as food processing; hunting and gathering including gathering of firewood; fishing; house-building and repairing; woodwork including carving; metal work; trading; clothwork including spinning, weaving and dyeing; vehicle repairing; art work; basket making; etc.

Table 2 shows that the total hours of input of all types of family labor per household increase as one moves from non-participating to participating households partly as a result of greater household sizes. Among the non-participating households the upland rice farm absorbs the highest proportion of all categories of family labor time (about 45 percent) with the cocoa/coffee farms being the next most important claimant on family labor time. As is to be expected the distribution of household labor among enterprises changes as we move to the participating groups. Among participating households the most important absorber of household labor is the improved swamp rice farm followed by the upland rice farm for Group B households, but by the oil palm plantation among Group C farmers. There is no sex difference with regard to the most important enterprise to which different classes of household labor allocate their time but there is a slight difference with regard to the secondary enterprise. For Groups A and C households the secondary enterprise is an economic tree crop for male adults but it is upland rice for adult females. These figures therefore show that adult men spend a higher proportion of their time on the export tree crop enterprises (oil palm, cocoa and coffee) than do the women.

Table 3 further shows that men provide most of the input of labor in the export tree crop production (over 70 percent) while women provide over half the labor input in traditional upland rice production.

Table 2. Allocation of Family Labor Time<sup>a/</sup> in Farm and Rural Non-Farm Enterprises by Men, Women and Children in Participating and Non-participating Households in I.A.D.P., Sierra Leone, 1974-1975  
(Average Per Household Per Month)

Enterprise	Group A Non-participants				Group B First Year				Group C Second Year			
	Male		Female		Male		Female		Male		Female	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child	Adult	Child
Total Hours	150	26	151	4	178	20	165	16	237	122	282	19
Percent Allocated To:												
Upland Rice	42	44	47	53	13	30	27	29	9	16	13	10
Swamp Rice	19	12	12	0	62	51	46	60	52	47	48	66
Oil Palm b/	1	0	0	0	5	6	0	0	21	20	5	1
Cocoa/Coffee	24	31	7	24	7	9	1	0	2	0	2	2
Other Farm	2	8	8	12	4	2	11	3	8	9	15	11
Non-farm	8	4	12	6	6	1	8	3	5	4	7	6
Sold Out	4	2	13	6	3	1	6	5	3	3	10	4
Total	100	101	99	101	100	100	99	100	100	99	100	100

a/ Includes only people normally resident in the household, i.e., does not include family members who were resident outside the village for extended periods but returned and worked with the household periodically.

b/ Includes harvesting of wild oil palm.

Source: Field Survey.

However women do provide a substantial proportion of the household labor input in the cultivation of tree crops. Table 3 shows that women contribute almost half the labor for the improved swamp rice farming system fostered by I.A.D.P.

Table 2 shows that women spend more of their time on non-farm enterprises than do the men. Around 60 percent of the household labor devoted to non-farm enterprises is female labor (Table 3) and the proportion of female labor devoted to non-farm activities is higher among non-participating than among participating households indicating that the I.A.D.P. has encouraged a slight shift from non-farm to farm activities by women.

In summary, Tables 2 and 3 present information confirming the hypothesis that men provide a higher proportion (70 percent) of the labor input in export crop cultivation while women provide a higher proportion of the input in traditional food crop production, in this case upland rice production. But the data also show that in households participating in the development project women and men devote the greatest proportion of their time to the crop being developed, i.e., swamp rice production in this case. During the land development phase in the first year of participation (Group B) a greater proportion of the labor input is provided by men (55 against 38 percent by women). After the land has been developed (Group A) men provide about 42 percent of the labor while women provide 46 percent with children providing an increased share of total household labor input as we move from the non-participating Group A to participating Group C. It is of interest to see what type of activities (jobs) men and women actually perform.

**Table 3. Contribution of Different Types of Family Labor to Farm and Rural Non-farm Enterprises by Participating and Non-participating Households in I.A.D.P., Sierra Leone, 1974-1975**

(Average Per Household Per Month)

Enterprise	Group A Non-participants				Group B First Year				Group C Second Year						
	Total	Adult		Child		Total	Adult		Child		Total	Adult		Child	
		M	F	M	F		M	F	M	F		M	F		
	Hours <sup>a/</sup>	%	%	%	%	Hours <sup>a/</sup>	%	%	%	%	Hours <sup>a/</sup>	%	%	%	%
Upland Rice	141	45	50	4	1	74	32	61	4	3	69	29	55	15	1
Swamp Rice	49	58	39	3	0	199	55	39	3	2	295	42	46	10	2
Tree Crops	50	73	18	8	1	25	88	6	6	0	87	63	22	15	0
Other Farm	18	24	69	6	1	26	27	71	1	1	66	27	63	8	2
Non-farm	31	38	60	2	0	24	42	57	0	8	35	34	58	7	2
Labor Sold Out	27	23	75	1	0	17	32	65	1	2	38	19	74	6	1
<b>Total</b>	<b>314</b>	<b>48</b>	<b>47</b>	<b>4</b>	<b>1</b>	<b>361</b>	<b>49</b>	<b>46</b>	<b>3</b>	<b>2</b>	<b>590</b>	<b>40</b>	<b>48</b>	<b>10</b>	<b>2</b>

<sup>a/</sup> Man-hour equivalents. Two child hours = one woman-hour = one man-hour. For definition of family labor types, household groups and enterprises see text and Table 1.

Source: Field Survey.

4.3: Distribution of Family Labor by Activity (Job)

Table 4 shows that the most important farming activity for all types of household labor for participating and non-participating households was land preparation and planting, i.e., plowing, harrowing, broadcasting and transplanting where relevant. Women allocate a slightly higher proportion of their time to this activity than men. The second most important job is weeding and underbrushing. This is followed by brushing and felling of trees for men, and harvesting for women.

As expected Table 5 shows that brushing and felling, clearing, and land development--the "heavy" jobs--are male dominated activities. It is surprising to see that weeding and underbrushing<sup>6/</sup> which is usually regarded as women's work, received a substantial input of adult male labor even among the non-participating, more traditional households, Group A. Another activity usually regarded as women's work is pest control (bird and monkey scaring). Table 5 shows that men supply more of the labor input than women for this so-called "woman's" activity, even among the non-participating household, where 64 percent of the labor is male labor. If there is any female dominated activity, it is harvesting where about 60 percent of the family labor input is provided by adult women (Table 5).

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<sup>6/</sup> It should be pointed out that women predominate in weeding of annual crops while men predominate in underbrushing (weeding) of tree crops. But men and women take active part in weeding of annual crops as well as underbrushing of tree crops.

Table 4. Allocation of Family Labor Among Different Farm Activities<sup>a/</sup> by Participating and Non-participating Households in I.A.D.P., Sierra Leone, 1974-1975  
(Average Per Household Per Month)

Activity	Group A Non-participating				Group B First Year				Group C Second Year			
	Adult		Child		Adult		Child		Adult		Child	
	M	F	M	F	M	F	M	F	M	F	M	F
Total Hours	132	110	25	3	162	141	19	15	218	234	113	17
Percent Allocated To:												
Brushing and Felling	21	0	18	0	18	0	15	0	15	4	9	0
Clearing	8	2	3	0	5	2	3	9	2	1	2	1
Land Development	0	0	0	0	7	1	9	0	2	1	0	1
Land Preparation and Planting	26	32	23	20	43	47	46	80	43	50	37	62
Weeding and Underbrushing	21	29	19	33	8	12	12	3	18	11	24	16
Pest Control	7	3	14	0	4	0	11	0	3	2	12	0
Harvest	12	23	9	7	8	23	3	4	6	12	6	9
Other Farm	5	12	13	40	7	14	2	3	10	19	10	12
Total	100	101	99	100	100	99	101	99	99	100	100	101

<sup>a/</sup> Does not include non-farm activities and labor sold out.

Table 5. Importance of Different Types of Family Labor in the Supply of Labor for Farm and Non-farm Activities (Jobs) by Participating and Non-participating Households in I.A.D.P., Sierra Leone, 1974-1975  
(Average Per Household Per Month)

Activities	Group A Non-participating					Group B First Year					Group C Second Year				
	Total	Adult		Child		Total	Adult		Child		Total	Adult		Child	
		M	F	M	F		M	F	M	F		M	F	M	F
Hours <sup>a/</sup>	%	%	%	%	Hours <sup>a/</sup>	%	%	%	%	Hours <sup>a/</sup>	%	%	%	%	
Brushing and Felling	31	91	2	7	0	31	94	2	4	0	47	70	20	10	0
Clearing	13	82	15	3	0	7	63	29	3	5	8	63	20	16	1
Land Development	0	0	0	0	0	13	82	11	7	0	6	68	31	0	2
Land Preparation and Planting	72	47	49	4	0	145	48	44	3	4	237	40	49	9	2
Weeding and Underbrushing	63	45	51	4	1	31	43	53	4	1	81	49	33	17	2
Pest Control	14	64	24	12	0	9	82	7	11	0	18	38	25	37	0
Harvest	42	37	60	3	0	46	29	69	1	1	47	30	61	7	2
Other Farm	22	32	58	7	3	30	36	63	1	1	74	30	61	8	1
Non-farm	31	38	60	2	0	24	41	57	1	1	35	34	57	7	2
Labor Sold Out	27	23	75	1	0	17	33	64	1	2	38	19	74	6	1
<b>Total</b>	<b>314</b>	<b>48</b>	<b>48</b>	<b>4</b>	<b>1</b>	<b>361</b>	<b>49</b>	<b>46</b>	<b>3</b>	<b>2</b>	<b>590</b>	<b>40</b>	<b>48</b>	<b>10</b>	<b>2</b>

<sup>a/</sup> See Table 3 for notes and definitions.

Source: Field Survey

#### 4.4. The Burden of Work

Table 6 illustrates the seasonality of work done by each of the four types of family labor. The figures show, as expected, that the mean hours of work per household member is higher among participating than non-participating households for all classes of labor, i.e., household members in Groups B and C had to work longer hours than Group A household members. The work load is substantially higher during the first year of participation in the project when the inland swamp farm is being developed.

But what about the differential effect by sex? Table 6 shows that there is hardly any increase in the average monthly hours of work for women as we move from Group A to C. There is a 4 percent rise from A to B and a 10 percent difference between A and C. For adult males the increases are 93 percent between A and B and 40 percent between A and C. It is the male children that have the greatest increase in their work load, especially during the first year of participation in the project (130 percent increase). They provide 44 percent of the total labor input (man-hour equivalents) in land preparation and planting during the development year (Group B) compared to 4 percent among non-participants and 4 percent during the second year of development (Group C) (Table 5). These figures therefore show that the I.A.D.P. does not have an adverse effect on women's work load. The work load of women is hardly affected, while that of the men and male children is substantially increased.

Table 6 also shows the seasonal distribution of work by household members. Peak load is in the June to August period when rice farms are planted and weeded, while the slack period is in February/March

**Table 6. Seasonality of Farm and Non-farm Work by Family Members  
in Participating and Non-participating Households  
in I.A.D.P., Sierra Leone, 1974-1975  
(Average Hours of Work<sup>a/</sup> Per Household Member)**

Month	Group A Non-participants				Group B First Year				Group C Second Year			
	Adult		Child		Adult		Child		Adult		Child	
	M	F	M	F	M	F	M	F	M	F	M	F
May 1974	67	46	19	97	187	96	215	99	167	139	176	136
June 1974	<u>147</u>	<u>140</u>	70	90	231	145	272	<u>156</u>	162	156	156	<u>149</u>
July 1974	114	145	90	108	228	153	232	141	<u>232</u>	<u>143</u>	168	100
Aug. 1974	141	<u>164</u>	<u>200</u>	<u>119</u>	<u>268</u>	144	<u>289</u>	110	201	<u>211</u>	<u>193</u>	117
Sep. 1974	93	114	62	34	207	116	260	85	137	143	185	74
Oct. 1974	68	106	28	35	140	80	196	63	92	89	121	52
Nov. 1974	67	106	85	28	124	97	219	25	84	83	108	52
Dec. 1974	68	54	131	0	134	80	160	18	66	60	111	64
Jan. 1975	70	74	76	0	151	87	173	0	82	60	114	16
Feb. 1975	81	41	73	0	131	52	176	0	69	34	55	23
Mar. 1975	60	18	35	0	102	19	161	0	95	22	82	6
Apr. 1975	51	29	85	0	125	36	152	3	85	28	88	2
May 1975	74	48	183	0	103	20	115	0	80	28	67	23
Average	85	84	88	38	164	87	202	54	119	92	125	63

<sup>a/</sup> Child hours have not been adjusted to man-hour equivalents.

Note: Month of peak load underlined.

Source: Field Survey.

after harvest. During the month of peak labor demand adults work close to twice as many hours as the monthly average.<sup>7/</sup>

#### 4.5. Hired Labor and Wage Rates

So far we have discussed the use of household family labor in farm and non-farm production. Rural households usually need to hire labor to supplement family labor particularly during periods of peak demand. Table 7 presents figures on the use of hired labor by participating and non-participating households in I.A.D.P.

Labor can be hired on a daily basis (daily wage labor) or could be given a contract for completion of a specified piece of work (contract labor). Table 7 shows that the greatest proportion of labor hired was on a daily basis. Almost an equal amount of female and male labor was hired by non-participating households. Participating households hired more labor, the increase being higher for male than female labor. Male labor is usually hired for brushing/felling and land preparation/planting activities while female labor was hired mainly for harvesting and land preparation/planting.

Table 8 shows the wages earned by the different categories of hired labor per day. The mean daily wage received by children was half that received by men, while that received by women was 64 percent of the adult male wage. Do these figures indicate sex discrimination in wage rate? Looking at the daily wages by activity we can see that for harvesting

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<sup>7/</sup> It is worth noting that the mean hours of work shown in Table 6 for men and boys results in annual input hours well above the 1,200 hours which Brandt [3] states is the maximum to be expected for Africa.

Table 7. Use of Hired Labor by Participating and Non-participating Households in I.A.D.P., Sierra Leone, 1974-1975  
(Average Per Household Per Month)

Labor Type	Hours Hired	Percent Distribution of Labor Hired									Total
		Brushing and Felling	Clearing	Land Development	Land Preparation and Planting	Weeding	Pest Control	Harvest	Other Farm	Non-Farm	
<b>Group A (Non-participants)</b>											
Daily wage - Adult male	26	40	0	0	41	14	0	2	1	2	100
- Adult female	24	0	0	0	43	16	0	32	2	7	100
- Children	6	2	0	0	32	15	0	43	8	0	100
Contract - Adult male	5	0	0	0	0	100	0	0	0	0	100
<b>Group B (First Year)</b>											
Daily wage - Adult male	59	31	0	4	58	3	0	1	2	0	99
- Adult female	39	0	0	0	26	1	0	68	4	2	101
- Children	1	0	0	0	50	38	0	12	0	0	100
Contract - Adult male	5	0	0	0	100	0	0	0	0	0	100
<b>Group C (Second Year)</b>											
Daily wage - Adult male	56	28	0	3	42	11	0	5	2	9	100
- Adult female	39	0	0	0	17	12	0	61	5	4	99
- Children	12	17	0	0	63	13	1	3	3	0	100
Contract - Adult male	9	63	0	0	15	15	0	0	6	0	99

Source: Field Survey

Table 8. Hired Labor Wage<sup>a/</sup> by Job in I.A.D.P.,  
Sierra Leone, 1974-1975  
(Leones Per Day)<sup>b/</sup>

Job	Daily Wage			Contract
	Male	Female	Children	Male
Brushing and Felling	0.66	--	0.35	1.12
Land Development	0.57	--	--	--
Land Preparation and Planting	0.66	0.46	0.34	1.06
Weeding Annual Crops	--	0.30	0.36	--
Underbrushing Tree Crops	1.01	--	--	1.27
Harvesting	0.44	0.46	0.32	--
Threshing Rice	--	0.31	--	--
Other Farm Work	0.47	0.25	--	--
Non-farm (Construction)	0.55	--	--	--
Average <sup>c/</sup>	0.67	0.43	0.34	1.13

<sup>a/</sup> Cash wage plus value of wage received in kind.

<sup>b/</sup> Le1.00 = \$1.20 at time of survey.

<sup>c/</sup> Analysis of variance shows that these means are significantly different at less than 1 percent probability.

Source: Field Survey.

men and women receive virtually the same wage, but for land preparation and planting the wage for female labor is 70 percent of the male wage. It is reasonable to expect that men should be more productive in the more physically demanding task of digging and puddling swamp fields, but not be any more productive than women in the much less physically demanding tasks of harvesting rice using a small knife. It would therefore appear that the sex differences in wage rates shown in Table 8 are in the main a reflection of productivity differences. The contract labor wage is higher than the daily labor wage, again a reflection of the fact that contract labor tends to be more productive than labor hired on a daily basis. This should be regarded as only a preliminary conclusion. Final judgement on the issue of sex discrimination in rural wage rates in Sierra Leone must await the calculation of marginal productivities for the different classes of hired labor.

## 5. Conclusion

In this paper changes in the labor input of women, men and children have been examined in an agricultural development project in Sierra Leone in which land-saving biological and chemical technology is being introduced. It has been shown that women worked slightly harder in the development project, but that the increase in their work load was much less than the increase in the work load of adult males and children. As recently shown to be the case in Malawi [6], women in I.A.D.P., Sierra Leone, play a substantial role in the cultivation of a "development" crop (swamp rice) using improved technology. In this case therefore the hypothesis that women do not use the improved technology introduced

by agricultural development projects and that the projects place an uneven burden on women vis-a-vis men (or children for that matter) is proved to be incorrect.

### 6. Some Areas for Further Research

In this paper we have only looked at one type of agricultural development project--a small holder project with minor water control in rice production but with no mechanization, i.e., a project introducing mainly land-saving and biological and chemical technology. Could the same conclusion be drawn for large scale mechanization projects, i.e., projects introducing labor saving technology or projects involving the introduction of perennial cash crops into traditional farming systems? Ongoing research by this author is aimed at testing the hypothesis in

other types of development projects in Sierra Leone (appendix).

In this paper also the returns of income earned by women have not been quantified and discussed, except that the analysis of wage rates for hired labor gives an indication of differential earnings by age/sex categories. This is because most of the input of female labor is directed to farm and non-farm activities in which men and women jointly participate.<sup>8/</sup> Incomes generated are therefore earned jointly by men, women and children. In order to estimate returns marginal productivities would need to be estimated. This is also part of the program of work

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<sup>8/</sup> The situation described here is therefore quite different from the situation in northern Nigeria where rural women spend most of their time in specialist female activities indicating further the need for empirical studies in different regions [21].

for our ongoing research (appendix).

An area which needs empirical research relates to the role of women as household decision makers. What is the role of women in the making of farm and non-farm decisions? What benefits do they derive from such decisions? In this respect we need to go well beyond a mere cataloging of whether women do or do not participate in household decision making.<sup>9/</sup> We need to quantify and analyze the degree of their participation.

Empirical evidence is also needed on the decision to educate, emphasizing sex differences where appropriate. We need analyses of why female education is low in rural areas. Possible reasons to be examined are the higher dropout rates which may decrease expected returns, low returns to female education because of lower wages and less economic alternatives and social factors, e.g., ethnic groups.<sup>10/</sup>

We also need empirical evidence on the relationship between fertility and female work. How does the female role vary with the age of her children?

As a link between the rural and urban labor markets the importance of women in the rural-urban migration streams need to be analyzed.<sup>11/</sup> The role of women as entrepreneurs and leaders also needs empirical analysis, especially of their role in trade and other urban enterprises dominated by female entrepreneurs. What returns do they earn and what constraints do they face, e.g., what is the effect of tariff structures or

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<sup>9/</sup> An example of the "catalog" type of study is that recently completed by Development Alternatives, Inc. [7].

<sup>10/</sup> For an example of a useful beginning in the analysis of female access to education in Kenya see Kinyanjui [11] and Krystall and Pala [12].

<sup>11/</sup> See Byerlee and Tommy [4] for some very timely research which sheds light on this issue.

lack of access to credit and other resources.<sup>12/</sup>

In this paper therefore I have only tackled a small portion of the total problem. The paper has shown, if anything, the need for empirical testing of many of the current generalizations about the role of women in economic development. Without such empirical testing we stand the danger of seeing scarce resources fritted away in trying to solve non-existent problems.

<sup>12/</sup> Ongoing research by Chuta and Liedholm [5] will provide useful information here.

APPENDIX

Research Proposal

**Title:** The Dynamics of Female Participation in the Economic Development Process in West Africa

**Time Period:** July 1, 1976 through June 30, 1977

**Investigator:** Dunstan S. C. Spencer  
Visiting Scholar  
Department of Agricultural Economics  
Michigan State University  
East Lansing, Michigan 48824, U.S.A.

Narrative Summary

The research will analyze the participation of women in the economic development process in West Africa, identify barriers to their participation in development projects and determine policies that would lead to increased participation and increased benefits to women. Quantitative information will be provided on the degree and type of female participation in household decision making in both rural and urban areas as well as on the seasonality of the use of female labor in farm, rural non-farm and urban enterprises. Regression analysis will be used to determine the relative importance of factors influencing female participation and incomes generated in different farm and non-farm systems. Factors to be examined include household income, farming systems, level of technology, household size and its composition, level of education, ethnicity, etc. These analyses will test the hypothesis that women "lose out" in the economic development process.

By building on an existing unique data base in Sierra Leone at very low cost the research will provide planners in West Africa, foreign donors, etc., with measures of the importance of female labor in farm and non-farm production, their importance as generators of household income as well as an examination of the factors that limit female participation in the economic development process.

Research Purpose

As part of a general concern with equity in the economic development process, planners, policy makers and action agencies have recently

been concerned with the role women play in the economic development process and the benefits they derive. Reflecting this concern the Congress of the United States passed what is commonly called the "Percy Amendment" providing USAID and other U.S. agencies with a mandate to ensure that women participate and benefit fully from economic development projects.

The economic development literature has recently generated a number of articles and monographs on women's role in development (see bibliography). With two or three exceptions notably Boserup [2], Clark [6] and Achola Pala [18], the writings are too general and provide very little quantitative analyses of the dynamics of female participation in economic development that would be useful to policy makers and planners. Action programs none-the-less need to and are being developed by governments and foreign aid agencies.

This research proposes to provide quantitative empirical analysis of the role of women in the economic development process in West Africa, that would be useful to policy makers. Since the study mainly utilizes an existing unique data base the research can be executed at low cost and completed in one year.

The specific objectives of the research project are:

1. To determine the quantity and seasonality of the use of female labor in farm, rural non-farm and urban enterprises and thereby to determine the relative importance of women as generators of household income in Sierra Leone.

2. **To quantitatively analyse the relative importance of socio-economic factors that determine the economic role of women in rural and urban areas and to describe the role of women with respect to activities performed in Sierra Leone.**
3. **To examine the differential access to education by rural and urban women and determine its effect on the rural-urban migration process and female participation in the modern sector of Sierra Leone.**
4. **To examine the role of women in household decision making in rural and urban areas.**
5. **On the basis of the above analyses to recommend policies and programs that would increase woman's participation in and their benefits from economic development projects in West Africa.**

### Methods of Analysis

This analysis will concentrate on detailed micro-economic evaluation of the effects of economic development on female participation in household decision making and income generation using mainly cross-section data.

First of all the degree to which women participate in household decision making among different income groups in different situations in both rural and urban areas will be quantified. The total quantity and seasonality of use of female labor in food and cash crop production, in rural non-farm activities as well as in urban small-scale industry will be determined. The relative importance of different factors affecting the use of female labor will be measured using regression analysis. Factors to be considered include household income and its composition, i.e., proportion of the income derived from food, cash crop and other non-farm businesses, household composition and size, the ethnic group and the education of the women.

As a link between the rural and urban labor markets, the importance of women in the rural-urban migration streams will be determined. Factors affecting the female decision to migrate (e.g., level of education, etc.) and their phasing into the urban labor market will be analysed.<sup>1/</sup>

Examples of types of analyses to be performed include:

1. Effects of new technologies on women's work load, e.g., does tractorization relieve men of the land ploughing/clearing operation but add to the weeding to be done by women?
2. Detailed analysis of the labour markets with respect to sex, e.g., how do wages vary with respect to sex in rural and urban areas?

<sup>1/</sup> This analysis will draw mainly on migration research by Byerlee and Tommy.

3. To what extent are male and female roles responsive to change? Are traditional labor roles altered by changing economic pressures, e.g., if there is a labor bottleneck in a traditionally sex specific activity will these bottlenecks be solved by participation of the other sex.

4. What is the relationship between fertility and female work? How does the female role vary with the age of her children and alternatively what role do young children play in the rural labour force?

5. Analysis of the decision to educate emphasizing sex differences. Analysis of why female education is low in rural areas? Possible reasons to be examined are:

- a. Higher drop-out rates decrease expected returns.
- b. Low returns to female education because of lower wages and less economic alternatives.
- c. Social factors, e.g., ethnic group.

6. Analysis of women as entrepreneurs and leaders. Analysis of the role of women in trade, gara production<sup>1/</sup> and other enterprises dominated by women entrepreneurs. What returns do they earn and what constraints do they face, e.g., what is the effect of the tariff structure or the lack of access to credit and other resources?

The above analysis will test a number of hypotheses about women in the economic development process. For example many writers assert that women provide the bulk of the labor input in traditional food production systems in West Africa and have a very important role in small scale non-farm commercial enterprises and they generate a major source of household

<sup>1/</sup> Hand tie and dye cloth.

income in rural areas. These writers also assert that the commercialization of agriculture, urbanization and growth of the modern sector encourage women to provide more manual labor but women earn lower returns because they lose their traditional sources of income in rural areas while they do not derive equal benefits with men from economic development projects. These hypotheses will be rigorously tested with a national data base that has already been generated for Sierra Leone.

#### Source of Data

The major source of data for this analysis will be derived from detailed micro level surveys already undertaken in Sierra Leone.<sup>1/</sup> Five-hundred randomly chosen rural households were interviewed twice weekly over fifteen months in 1974/75 to provide information on (a) production relations including both farm and non-farm enterprises, (b) consumption differentiated by farm, rural non-farm, urban and imported origins and savings, (c) investment and sources of credit, (d) fertility, migration and education, and (e) changes over time in farming systems. The rural household sample is differentiated by resource base and production systems and further differentiated by technology. In addition a group of 150 fishing households were included.

In the urban areas, differentiated by size categories, about 250 small scale industrial farms were similarly surveyed and 800 migrants from rural

<sup>1/</sup> Survey undertaken as part of the African Rural Employment Research Project financed by AID/csd 3625, Rockefeller Foundation, Population Council of New York and Foreign Area Fellowship program.

households were traced into urban areas and their job opportunities and incomes recorded.

A unique feature of the above surveys is that the labor input in all activities including food crop processing was broken down by sex and age. This provides national quantitative information on female labor which is not available for any other African country. Since the data were collected by continuous interviewing, it also contains details on seasonality of food processing not usually available. The migration survey ascertained who made the decision to migrate but the other surveys mentioned above did not specifically determine who made other household production and consumption decisions. Therefore, it will be necessary to administer a one contact questionnaire to a sample of rural and urban households in order to quantify the role women play in household decision making.

It is planned that this survey will be conducted over a four week period during the summer of 1976 in cooperation with the Department of Agricultural Economics, Njala University College, University of Sierra Leone. A sub-sample of the 500 rural households interviewed in 1974 will be re-interviewed in 1976. Also a sample of urban households will be interviewed to obtain information on female participation in household decision making, women's work and wages earned in the modern sector. A short questionnaire will be administered to large scale industrial firms and government departments to determine the proportion of female labor employed, wages paid and attitudes to future employment of women.

To supplement the Sierra Leone data secondary macro information will be collected on women's work in other West African countries, e.g., manufacturing surveys, population censuses and other special labor surveys con-

ducted over the past ten years. These data will provide a framework for making cross country comparisons and building on the detailed micro data available only for Sierra Leone.



## BIBLIOGRAPHY

- Agricultural Development Council Research and Training Network.  
"Role of Women in Development," Seminar Report, A/D/C., R.T.N.,  
October 1975.
- Boserup, Ester. Women's Role in Economic Development. New York:  
St. Martins Press, 1970.
- Brandt, Hartmut. Promotion of Agricultural Self-Employment: Labor  
Supply and Subsidy Problems. Berlin: German Development Insti-  
tute, 1974.
- Byerlee, Derek and Joseph Tommy, "Rural-Urban Migration in Sierra  
Leone: Determinants and Policy Implications," forthcoming  
African Rural Economy Paper, Department of Agricultural Economics,  
Michigan State University, East Lansing, Michigan, 1976.
- Chuta, Enyinna and Carl Liedholm. "The Role of Small Scale Industry  
in Employment Generation and Rural Development: Initial Re-  
search Results from Sierra Leone," African Rural Employment  
Paper No. 11, Department of Agricultural Economics, Michigan  
State University, East Lansing, Michigan, 1975.
- Clark, Barbara A. "The Work Done by Rural Woman in Malawi," Eastern  
Africa Journal of Rural Development, 8, 1 & 2 (1975): 80-91.
- Development Alternatives Incorporated. "A Seven Country Survey of  
the Roles of Women in Rural Development," report prepared for  
AID, Washington, December 1974.
- Hanyami, Y. and V. W. Ruttan. Agricultural Development: An Inter-  
national Perspective. Baltimore: The Johns Hopkins Press,  
1971.
- Heady, Earl O. "Basic Economic and Welfare Aspects of Farm Tech-  
nological Advance," Journal of Farm Economics, 31 (May 1949):  
293-316.
- Kearl, B (Ed.). Field Data Collection in the Social Sciences: Ex-  
periences in Africa and the Middle East. New York: Agricul-  
tural Development Council, Inc., 1976.
- Kinyanjui, Kabiru. "Educational and Formal Employment Opportunities  
for Women in Kenya: Some Preliminary Data," Kenya Education  
Review (December 1975): 6-25.
- Krystall, Abigail and Achola Pala. "Women in Education," Kenya  
Education Review (December 1975): 1-6.

13. Levine, R. A. "Sex Roles and Economic Change in Africa," Black Africa: Its Peoples and Their Cultures, edited by John Middleton. New York: The Macmillan Co., 1970.
14. Mbilinyi, Marjorie J. "The New Woman and Traditional Norms in Tanzania," Journal of Modern African Studies, 10, 1 (May 1972): 57-72.
15. Norman, D. W. "Methodology and Problems of Farm Management Investigations: Experiences from Northern Nigeria," African Rural Employment Paper No. 8, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1973.
16. Okala, C. and S. Mabey. "Women in Agriculture in Southern Ghana," Manpower and Unemployment Research in Africa, 8, 2 (November 1975).
17. Pala, Ochola O. "The Role of Women in Rural Development: Research Priorities," Discussion Paper No. 203, Institute of Development Studies, University of Nairobi, Nairobi, Kenya, June 1974.
18. Pala, Ochola O. "A Preliminary Survey of the Avenues for and Constraints on Women in the Development Process in Kenya," Discussion Paper No. 218, Institute of Development Studies, University of Nairobi, Nairobi, Kenya, March 1975.
19. Paulme, Denise (Ed.). Women of Tropical Africa. Davis: University of California Press, 1963.
20. Sen, A. K. "The Choice of Agricultural Techniques in Underdeveloped Countries," Economic Development and Cultural Change, 7 (April 1959): 279-285.
21. Simmons, Emmy B. "Economic Research and Women in Rural Development in Northern Nigeria," Overseas Liaison Committee, Washington, D.C., April 1976.
22. Skonsberg, Else. "The Effect of Aid of Women in Developing Countries," Ceres, Food and Agriculture Organization, 1975.
23. Spencer, D. S. C. "Micro-level Farm Management and Production Economics Research Among Traditional African Farmers: Lessons from Sierra Leone," African Rural Employment Paper No. 3, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1972.
24. Spencer, D. S. C. "The Economics of Traditional and Semi-Traditional Systems of Rice Production in Sierra Leone," Proceedings of the WARDA Seminar on Socio-Economic Aspects of Rice Cultivation in West Africa, Monrovia, Liberia, 1974.

25. Swedish International Development Authority (SIDA). "Rural Women in Kenya and Tanzania," Development Digest, 13, 3 (July 1975): 53-60.
26. Tinker, Irene. "The Adverse Impact of Development on Women," paper presented to the AAAS Seminar on Women in Development, Mexico City, June 15-18, 1975.
27. Tollens, Eric. "Problems of Micro-Economic Data Collection on Farms in Northern Zaire," African Rural Employment Working Paper No. 7, Department of Agricultural Economics, Michigan State University, Michigan State University, East Lansing, Michigan, June 1975.
28. United States Agency for International Development. "Women's Influence on Development Told," Front Lines, 14, 1 (November 13, 1975).



AFRICAN RURAL EMPLOYMENT WORKING PAPERS

- WP No. 1 "African Rural Employment Study: Progress Report and Plan of Work, 1972-76," May 1974
- \*WP No. 2 Dean Linsenmeyer, "An Economic Analysis of Maize Production in the Kasai Oriental Region of Zaire: A Research Proposal, May 1974.
- WP No. 3 Hartwig de Haen, Derek Byerlee and Dunstan S. C. Spencer, "Preliminary Formulations of Policy Models of the Sierra Leone Economy Emphasizing the Rural Sector," November 1974.
- WP No. 4 Enyinna Chuta and Carl Liedholm, "A Progress Report on Research on Rural Small Scale Industry in Sierra Leone," November 1974.
- \*WP No. 5 "Plan of Work for the IDR/MSU Research Program in the Ada District of Ethiopia," November 1974.
- WP No. 6 William A. Ward, "Incorporating Employment into Agricultural Project Appraisal: A Preliminary Report," February 1975.
- WP No. 7 Eric F. Tollens, "Problems of Micro-Economic Data Collection on Farms in Northern Zaire," (also available in French, "Problems de Rassemblement des Données Micro-Economiques dans les Exploitations Agricole du Nord-Zaire").
- \*WP No. 8 "Annual Report for Period July 1, 1974 - June 30, 1975-- Rural Employment in Tropical Africa: A Network Approach," 1975.

---

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AFRICAN RURAL ECONOMY WORKING PAPERS

- WP No. 9. Carl K. Eicher, Merritt W. Sargent, Edouard K. Tapsoba and David C. Wilcock, "An Analysis of the Eastern ORD Rural Development Project in Upper Volta: Report of the M.S.U. Mission," 1976 (also available in French, "Une Analyse du Projet de Developpement Rural dans L'ORD de L'Est en Haute-Volta: Rapport de la Mission M.S.U.).
- WP No. 10. Tom Zalla, "A Proposed Structure for the Medium-Term Credit Program in the Eastern ORD of Upper Volta," 1976 (also available in French, "Projet de Structure du Programme de Credit à Moyen Terme dans l'ORD de l'Est en Haute Volta).
- WP No. 11. Dunstan S. C. Spencer, "African Women in Agricultural Development: A Case Study in Sierra Leone," April 1976.

---

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AFRICAN RURAL EMPLOYMENT PAPERS

- AREP No. 1 Derek Byerlee and Carl K. Eicher, "Rural Employment, Migration and Economic Development: Theoretical Issues and Empirical Evidence from Africa," 1972.
- AREP No. 2 Derek Byerlee, "Research on Migration in Africa: Past, Present and Future," 1972.
- \*AREP No. 3 Dunstan S. C. Spencer, "Micro-Level Farm Management and Production Economics Research Among Traditional African Farmers: Lessons from Sierra Leone," 1972.
- AREP No. 4 D. W. Norman, "Economic Analysis of Agricultural Production and Labour Utilization Among the Hausa in the North of Nigeria," 1973.
- AREP No. 5 Carl Liedholm, "Research on Employment in the Rural Non-farm Sector in Africa," 1973.
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- AREP No. 9 Derek Byerlee, "Indirect Employment and Income Distribution Effects of Agricultural Development Strategies: A Simulation Approach Applied to Nigeria," 1973.
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- AREP No. 11 Enyinna Chuta and Carl Liedholm, "The Role of Small Scale Industry in Employment Generation and Rural Development: Initial Research Results from Sierra Leone," 1975.
- AREP No. 12 Tesfai Teclé, "The Evolution of Alternative Rural Development Strategies in Ethiopia: Implications for Employment and Income Distribution," 1975.

---

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