INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE

PAPERS OF STAFF IN THE AGRICULTURAL ECONOMICS SUB-PROGRAM 1973 - October 1975.

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Resource Use, Income and Expenditure Patterns of Yoruba Smallholders

J. C. Flinn*

1. Introduction

Numerous authors [e.g. Clark and Haswell, 1970; Wharton, 1968] have discussed the problems of the limited resource base, the liquidity, and uncertain environment of the smallholder that influences his capacity and willingness to adopt capital requiring, improved agricultural technology. Two techniques used to study such problems in a positive framework are single and multi-period linear programming [e.g. Heyer, 1972; Langhan, 1968] and simulation [e.g. Zuckerman, 1970].

Irrespective of the technique used to investigate the impact of the resource base and the objectives of management on the growth of an agricultural firm, it is vital that the model reflects the relationships between resource use, the income of the farm family and the subsequent allocation of this income between consumption, investment and savings [Vandeputte and Baker, 1970]. Thus the purpose of this paper is to report on:

(a) the use of two of the major resources under the control of the farmer used in traditional agriculture -- the land and labor of the farm family; and

(b) the income and expenditure patterns of a sample of two groups of Yoruba smallholders situated in different agro-climatic zones in South-West Nigeria.

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Friday Seminar, IITA, December 20, 1974.

2. Sources of Data

Zuckerman [1973] studied three groups of Yoruba farmers with the view of identifying those factors which influenced their strategical and tactical decisions in farming. As part of this survey (conducted from April 1970 to April 1971) information was recorded on labour allocation income and expenditure patterns on a daily basis for a sample of 33 smallholder farmers in each of three villages. In the analysis reported in this paper data was taken directly from the questionnaires completed in the field by the enumerators for Akinlalu and Ilero. Idi-Emi was not included in this study as it is located on the escapment and as such is not representative of villages in either the high forest or the derived savannah zones.

The locations of the villages studied by Zuckerman -- Akinlalu, Idi-Emi and Ilero -- are shown in Figure 1. Akinlalu is situated in the main cocoa belt of Western Nigeria where cocoa dominates cropping patterns. Yams, maize and cassava are the most important food crops. Ilero is in the derived savannah belt and is unsuited for intensive tree crop production. Maize, white yam and cassava are the dominant forms of land use.

Both Akinlalu and Ilero have soils derived from the basement complex. Akinlalu has an average rainfall of some 1,400 mm a year and Ilero about mm a year. Planting rains normally commence in mid-March in Akinlalu and in early April in Ilero. In both villages rainfall has a bimodal distribution with the trough in August. Rains end in late October to early November and early to mid November in Akinlalu.

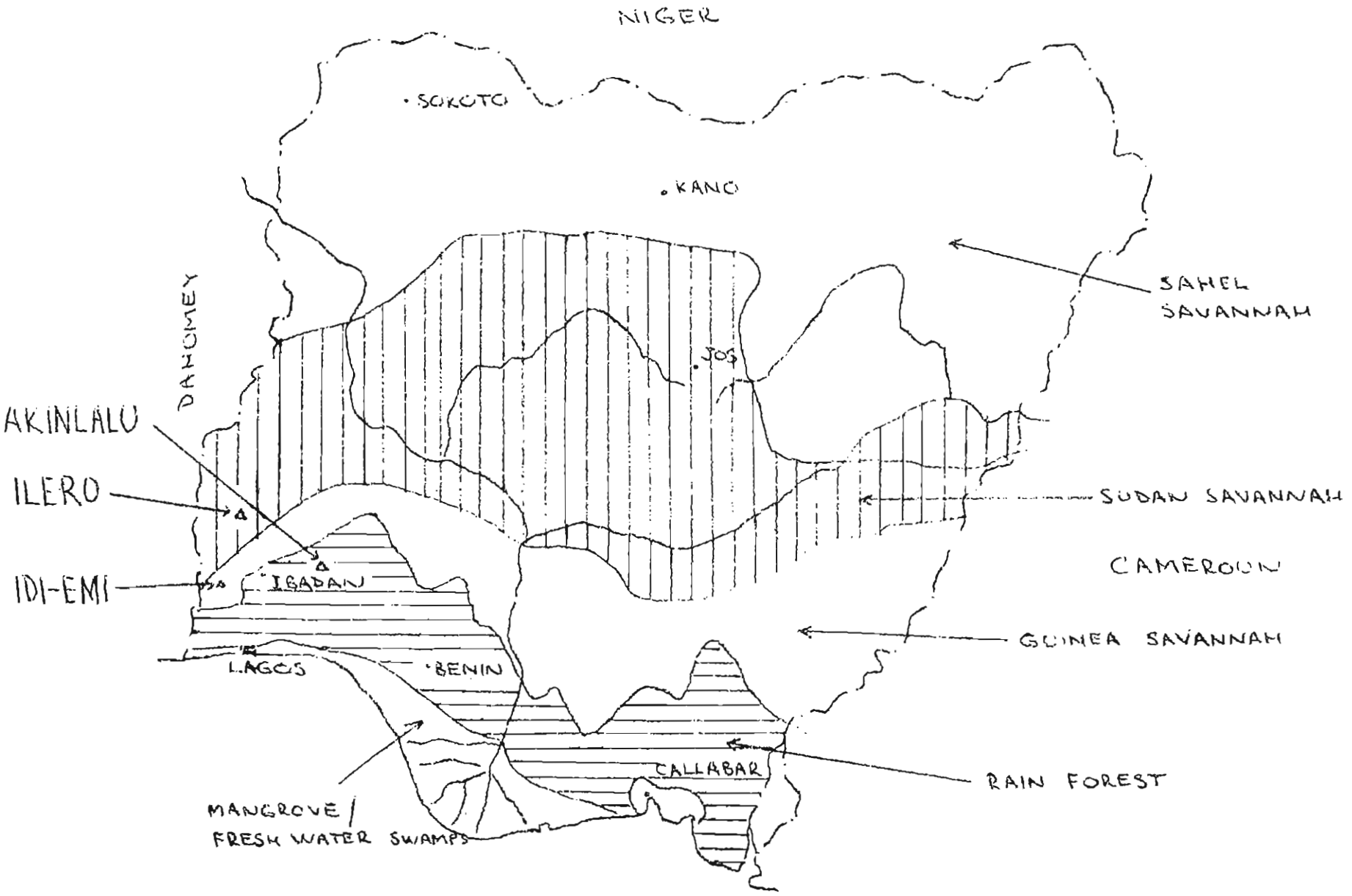


FIG 1. LOCATION OF THE TWO STUDY VILLAGES - AKINLALU AND ILERO IN S. W NIGERIA

3. The Resource Base of the Farm Families

3.1 The farm family.

The average number of people eating from the pot of the farmers sampled in Akinlalu and Ilero are listed in Table 1 together with the potential farm-family labor force expressed in man "equivalents". The average farm sampled in each village was made up of six or seven people with one or two adult males and females and two to four children. On a standard man basis, the average potential supply of farm labor was between 3.6 and 3.7 man equivalents in each village.

Table 1. Average of farm families sampled in Akinlalu and Ilero in number of people and in man equivalents.*

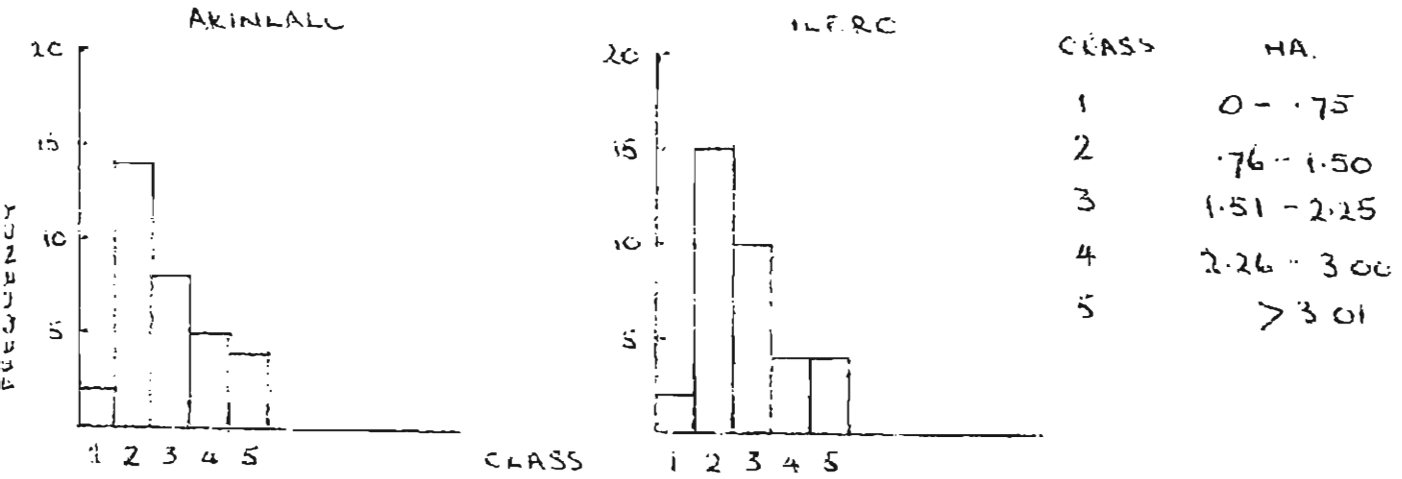
Labor class	Akinlalu	Ilero
Adult males	1.6	1.3
Adult females	1.8	2.1
Children	3.0	3.4
Total persons	6.4	6.8
Male equivalents	3.7	3.6

*The man equivalent weights are those used by Norman [1972]. The weights are 0.5 for children, 0.75 for adult females and 1.0 for adult males.

3.2 Cultivated area per farm.

The frequency distributions of the cultivated areas of the sampled farms in Akinlalu and Ilero are shown in Figure 2. The modal cultivated area of farms surveyed in both villages was of the order of one hectare; with mean farm

sizes of 1.70 hectares in Akinlalu and 1.63 hectares in Ilero. The distribution of cultivated land between families was positively skewed with less than half of the farm families cultivating more than two thirds of the land.



6.2: FREQUENCY DISTRIBUTION OF CULTIVATED AREA AKINLALU AND ILERO

While the distributions of farm and family sizes were reasonably similar in both villages, FAO [1966] have estimated that the population pressure in the region of Akinlalu, at 200 to 400 persons per square kilometer, is considerably higher than is the case in Ilero at 40 to 80 persons per square kilometer. The pressure on agricultural land in the region of Akinlalu results in good cocoa land being scarce. Indeed, several farmers in the area have acquired land in the Ondo area (some 70 kilometers to the east) to increase their cocoa production. In Ilero, on the other hand, additional land is available to those farmers who wish to increase their production of annual crops.

4. Labor Inputs to the Family Farm

The average number of days worked by various classes of labor on the average smallholder farm in Akinlalu and Ilero are listed in Table 2 for the 12 month period April 1970 to April 1971. The adult males provided over 75 per cent of the labor involved in growing and harvesting crops. The second major input of labor came from children within the farm family, the remaining 10 to 15 per cent of labor being supplied by adult females in the pot, hired, contract, free services and exchange labor. The labor input of 208 days per hectare in Akinlalu was significantly higher (at the 5 per cent level) than the 163 days per hectare recorded for Ilero.[1]

Table 2. Average labor input per farm, in days, for Akinlalu and Ilero*

Class of labor	Akinlalu Days	Akinlalu %	Ilero Days	Ilero %
Hired Labor	17	5	18	7
Contract labor	10	3	8	3
Adult males	281	79	204	77
Adult females	9	3	3	1
Children	35	10	28	10
Other	2	-	4	2
Total labor input	354	100	265	100
Labor input per hectare	208		163	

* Figures do not include time spent on food processing on the farm or marketing of produce, but does include the time taken to walk to and from the house to the farm plots.

The allocation of labor to various farm operations is listed in Table 3. In both villages the weeding of crops which includes removing weeds at the end of the dry season from plots where crops were grown the previous year was the major consumer of labor, averaging 52 per cent of labor used in Ilero and 72 per cent in Akinlalu. The significantly higher figure for weeding time in Akinlalu is a result of higher rainfall and more luxuriant weed growth in the high forest when compared to the derived savannah zone. On a percentage basis, harvesting was the second largest user of labor followed by planting. The majority of the 20 days of labor listed under "other" in Ilero was for staking yams; in Akinlalu yams are trained on maize stalks.

Table 3. Average labor use per farm in days for various farming operations in Akinlalu and Ilero

Operation	Akinlalu Days	%	Ilero Days	%
Clearing	13	4	7	3
Heap making	13	4	9	3
Planting	13	4	37	13
Weeding	256	72	139	52
Harvesting	44	13	57	22
Spraying cocoa	13	4	0	0
Other	2	0	20	7
Total	354		265	

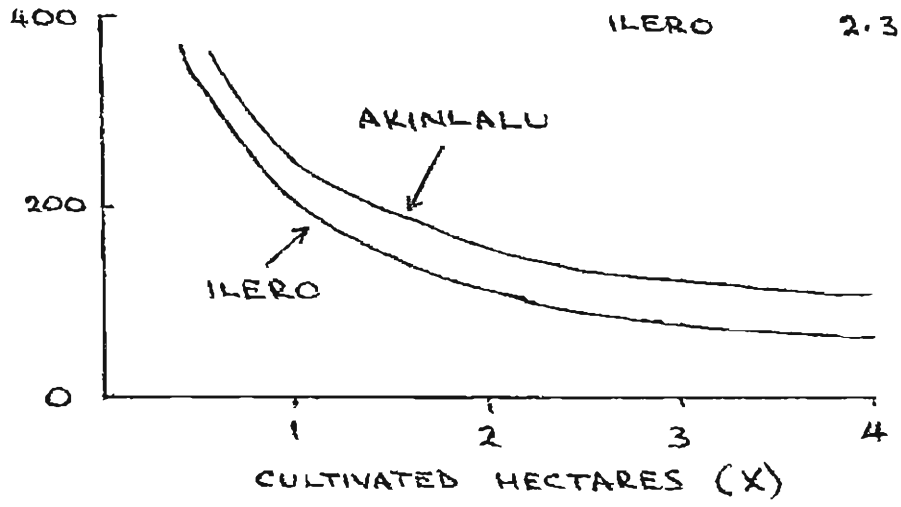
Further analysis of the labor data showed that hired and contract labor were largely used for weeding and to a lesser extent, heap making. The male members of the farm family spent over 50 per cent of their time weeding, the next largest use of their labor being harvesting crops (particularly cocoa and yams). The adult females spent between 70 and 80 per cent of their time on the farm harvesting, being involved to a minimal extent in the more physically demanding tasks of clearing and heap making. Children spent over 70 per cent of their time on the farm weeding and harvesting.

5. Land/Labor Relationships

5.1 Labor input per unit area

The relationships between family labor input per cultivated hectare and farm size are shown in Figure 3 for Akinlalu and Ilero. The figure shows that the input of family labor per cultivated hectare diminished (at a decreasing rate) as farm size increased. That is, larger farms tended to have lower family labor inputs per unit area than did smaller farms. However, no relationship was apparent between hired labor (when expressed on a per unit area basis) and farm size suggesting that families with larger farms did not hire that quantity of labor necessary to farm their land as intensively as did the farmers with smaller cultivated areas.

	Log b_0	b_1	r^2	F
AKINLALU	2.4040	-0.660^{***}	.62	19
ILERO	2.3163	-0.764^{***}	.61	23



IG 3 RELATIONSHIP BETWEEN LABOUR INPUT PER UNIT AREA AND THE CULTIVATED HECTARAGE OF THE FARM

5.2 Associations between labor inputs and cultivated area

The simple correlation matrix for farm size (i.e. cultivated area), family size (i.e. the number of people eating from the farmer's pot), family labor input, hired labor input and total labor inputs to farming in Akinlalu and Ilero are listed in Table 4. In both Akinlalu and Ilero a positive relationship existed between farm size and family size, although this correlation was only significant in the case of Akinlalu. In both villages the inputs of the farm family and hired labor were positively correlated, at least at the 10 per cent level, with farm size. Similarly, inputs of family labor were significantly correlated with farm size in Akinlalu and Ilero. However, in neither village was a significant association observed between family size and the use of hired labor.

Table 4. Simple correlation matrices of cultivated area and labor inputs for Akinlalu and Ilero+

Akinlalu \ Ilero	Farm Size	Family Size	Family Labor	Hired Labor	Total Labor
Farm size	-	.25	.49***	.30*	.40**
Family size	.43***	-	.26	.03	.16
Family labor	.43**	.46***	-	.07	.75***
Hired labor	.40**	.21	.44***	-	.70***
Total labor	.62***	.45***	.90***	.57***	-

+ n = 33; $r_{.01} = .45$; $r_{.05} = .35$; $r_{.10} = .30$

6. Gross and Net Incomes per Farm Family

6.1 Gross and net farm income

The major sources of farm income recorded for the sample of farms in Akinlalu and Ilero are listed in Table 5. As anticipated, cocoa production was the major source of income in Akinlalu, yam was the most important crop in Ilero. The farmers in both villages were predominantly crop farmers the value of livestock produced averaging in the order of ₦10 per farm per year. The average gross farm income of ₦320 in Akinlalu was some 55 per cent higher than was the case in Ilero at ₦206 per annum. On a per unit area basis, the average gross farm incomes per hectare for the samples in the two villages were ₦191 in Akinlalu and ₦126 in Ilero.

Table 5. Average gross farm incomes for a sample of farms in Akinlalu and Ilero, 1970-1971.

Source	Akinlalu	Ilero
Cocoa	97	-
Yams	45	60
Maize	25	36
Cassava	40	53
Pepper	4	6
Other crops*	102	41
Livestock	9	10
Gross Farm Income	325	206
Gross Farm Income per Hectare	131	136

*Other crops include beans, citrus, firewood, bananas and plantain, palm oil, palm wine, melons.

The average farm expenditures recorded for the two villages are listed in Table 6. The major agricultural expenditure in both villages was for hired labor; in Akinlalu largely for the cocoa crop, in Ilero for weeding of the food crops in May and June. In Akinlalu the average expenditure on fertilizers and pesticides was ₦8 per farm, mainly for pesticides and fungicides for capsid and black pod control in cocoa. The use of chemicals in Ilero averaged less than ₦1 per farm surveyed. The use of fertilizer in both villages was minimal.

Table 6. Average farm expenditure (₦) by category and net farm income for a sample of farmers in Akinlalu and Ilero, 1970-1971

Source	Akinlalu	Ilero
Gross farm income	325	206
Agricultural Expenditure		
Hired labor	17	20
Pesticides/fertilizer	8	
Tools and equipment	3	1
Total agricultural expenditure	28	21
Net farm income	297	185
Net farm income per hectare	175	112
Net farm income per man day*	91	77

*Net farm income per day of farm family and exchange labor.
-Less than ₦1.00.

Estimated average net farm incomes per farm, per hectare and per day of family labor input are listed in the last rows of Table 6. The higher average net farm incomes earned in the cocoa area when compared to the savannah zone are apparent. The average net income per day of labor input was less than ₦1.00, demonstrating the low return to labor realised in transitional agriculture.[2]

6.2 Non-farm income.

In addition to income earned from farming, all the sampled families had other sources of income -- whether this was a secondary occupation of the husband, petty trading activities of the wives and children, transfer payments or gifts. Thus in Table 7 the sources of non-farm incomes recorded for the sample survey in Akinlalu and Ilero are listed. In Akinlalu, gifts and transfer payments from non-resident members of the household were substantial at ₦74 per family per year, in Ilero these transfer payments seem to be less than half this amount -- less than ₦30 per family per year. Average net incomes from petty trading were ₦29 in the year in Akinlalu and ₦11 in 1970-71 in Ilero. The average net addition of non-farm income to the income of the family was in the order of ₦100 in Akinlalu and ₦40 in Ilero.

Table 7. Average non-farm incomes recorded for a sample of farms in Akinlalu and Ilero, 1970-1971.

Source	Akinlalu	Ilero
Gross non-farm income		
Petty trading	57	37
Gifts/transfer	74	27
Total non-farm income	136	64
Trading expenditure	34	25
Net non-farm income	102	39

6.3 Gross and net family income.

The net income of the farm family consists of income from farm and non-farm sources. Hence in Table 8 the overall income picture of the sample of farmers in the two villages is summarised. The average net family income in Akinlalu was estimated as ₦399 and in Ilero, ₦324 in the year's study period. In Akinlalu, non-farm sources of income accounted for over 25 per cent of net family income and in Ilero 17 per cent of net family income. Thus non-farm sources of income contributed substantially to the net income of the farm family.

Table 8. Estimated average gross and net incomes (₦) of farmers sampled in Akinlalu and Ilero, 1970-1971.

Source		Akinlalu		Ilero	
(a)	Farm				
	Gross farm income	325		206	
	Cash farm expenses	28		21	
	Net farm Income		297		185
(b)	Non-farm				
	Gross non-farm income	136		64	
	Cash non-farm expenses	34		25	
	Net Non-Farm Income		102		39
(c)	Net Family Income		399		324

In summary, farm families in the village in the cocoa zone have a higher family income due to (a) the existence of the relatively profitable cocoa crop and

and (b) higher non-farm sources of income.

7. Relationships between Agricultural Production and Resource Use

The gross income earned from farming flows from the resources committed to agricultural production. Presumably, the total value of farm output will be positively related to the cultivated area of the farm, the value of purchased inputs used (hired labor, fertilizers chemicals), and the number of days of labor allocated to farming. In addition, other factors influence the value of farm output. For example, the managerial capacity of the farmer would influence his realized crop yields, as would the fertility of the soil. Farmers with larger families may have to or are motivated to work more efficiently to ensure an adequate supply of food and cash for their families. Farmers with large non-farm incomes may or may not be those with larger farm incomes, there may be a degree of substitution between farm and non-farm sources of income.

On this basis, the following linear "whole farm" production functions were estimated using the data collected for Akinlalu and Ilero:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + e$$

Postulated sign of b_i

where

Y is the ₦ value of gross agricultural production;

X_1 is days of family labor used in farming; ≥ 0

X_2 is the cultivated area of the farm in hectares; ≥ 0

X_3 is agricultural expenditure in ₦; > 0

X_4 is net non-farm income in ₦: ?

X_5 is the number of persons in the household, expressed in consumption units and ? 0

e is the error term

As information on the managerial capacity[3] of the farmer and on soil fertility were not recorded during the survey, these variables were not included in the production functions.

The partial regression coefficients for the linear models estimated for the two villages are listed in Table 9. The (adjusted) coefficients of multiple determination indicate that some 31 and 69 per cent of variability observed in farm incomes was explained by the model. The F values show that both regressions were highly significant. From a statistical viewpoint, the function fitted for Akinlalu was unsatisfactory, some 70 per cent of the variability in the estimated gross farm incomes was not explained by the model, only two of the explanatory variables were significant at the 10 per cent level or better. However, they remain the best estimates available and were superior to alternative algebraic forms which were estimated.

The variable which appears to have the greatest impact on gross farm income in both villages is farm size. The value of additional farm land in Akinlalu was estimated as ₦66 per hectare, and in Ilero ₦33 per hectare.[4] Gross farm income was also significantly correlated with agricultural expenditure in both villages. In Akinlalu it appears that an additional ₦ invested in variable

Table 9. Partial regression coefficients of the estimated whole farm production functions for a sample of farms in Akinlalu and Ilero.

	Akinlalu		Ilero	
	Coeff.	t value*	Coeff.	t value*
Constant	99.007	-	-87.026	-
Family labor	0.156	.25	0.458***	2.69
Farm size	65.793*	1.81	32.504*	1.52
Agric. expenditure	1.307**	1.70	0.869**	1.85
Net non-farm income	0.034	.08	0.504	1.12
Family size in C.U.	0.697	.06	14.186***	2.56
R^2	.31		.69	
F value	3.26		9.84	
S_{yx}	187.26		72.52	
n	33		33	

*For 1 tailed t test and n = 30; $t_{.10} = 1.31$ $t_{.05} = 1.70$, $t_{.01} = 2.46$

inputs would yield a return of ₦1.90; in Ilero, ₦0.87, reflecting the potentially greater return from investing in farming in the cocoa than the savannah area. Indeed, given the current levels of technology employed in the two villages, together with the supply of purchased inputs available -- it appears that while it is highly profitable for the cocoa producer to apply added variable inputs, this may not be the case in the derived savannah zone

for the small farmer.

In neither village was gross farm income found to be significantly related to non-farm income. Similarly given the postulated model, gross farm income in Akinlalu was not significantly related to family size or the amount of family labor used in farming. In Ilero however the average value of an extra day of family labor was estimated to be ₦.46 and other things being equal, larger families seemed to have higher gross farm incomes in the savannah village.

8. The Subsistence Element - Home Consumption of Farm Produce

The transitional farmer is normally characterised as a farmer who uses traditional methods of production, has a level of living which is judged as meagre by most standards and consumes a substantial portion of the food crops he produces [Wharton, 1968; Johnson 1968]. Previous discussion in Sections 4 and 6 indicated that the sample of farmers used labor intensive non-mechanised systems of crop production and that net family incomes were low. A component of net family income of course is the value of farm grown food consumed by the household in other words, the subsistence element of the smallholder.

The values of home grown food that is consumed at the farm are listed in Table 10 together with the total value of farm production. The average value of home produced food consumed was close to ₦60 in both villages. The value of unprocessed home grown food consumed as a percentage of net farm income was estimated at 19 per cent for Akinlalu and 35 per cent for Ilero. Thus, the Yoruba smallholders exhibited a substantial degree of market orientation selling a major

portion of the crops they produced.

Table 10. The average values of home grown food consumed, estimated marginal propensities to consume home grown food, and the estimated elasticities of demand for home grown food in Akinlalu and Ilero, 1970-1971.

		Akinlalu	Ilero
Home grown food consumed per family	(₦)	57	64
Home grown food consumed as a per cent of			
(a) net farm income	(%)	19	38
(b) net family income	(%)	14	29
Marginal propensity to consume*	(₦)	.09	.20
Income elasticity of demand**		.39	.55

*home grown food. Regression coefficients significant at the one per cent level, estimated equation was $Y = a + b X$. Where Y is net farm family income and X is value of home produced foods consumed on the farm.

**estimated regression was $Y = {}_aX^b$; the b coefficients were significant at the one per cent level.

The marginal propensities to consume home grown food -- which represent an estimate of the increase in the value of home grown food consumed associated with a ₦1.00 increase in net family income -- are also listed in Table 10.[5] In the cocoa producing area, the coefficient of .09 indicates that as incomes rise, only a small proportion of this added income will be consumed in the form of home produced food. In Ilero, it appears that for a ₦1 increase in family income, some ₦.20 would be consumed as home produced food.

The income elasticities of demand for home produced food which represent the percentage increase in consumption for a one per cent increase in income -- are also listed in Table [illegible].[6] Since these figures are less than one, consumption of home grown food represents a declining porportion of income as it increases.

9. Total Consumption of Food and Drink

In addition to purchased items which could not be produced on the farm (e.g. sugar, salt, dried fish, bread, beverages), most families bought unprocessed food products from time to time (yams, rice, maize, beans, cassava, palm wine, etc.) and processed foods (gari, garri, abara, etc) which are manufactured from locally grown crops. The cost of purchased food and drink plus the estimated value of consumption of home grown food provided the estimate of the value of total food and drink consumed per family.

As shown in Table 11, the average value of total food and drink consumed in Akinlalu and Ilero was estimated as ₦[illegible] and [illegible] respectively for 1970-1971. Expenditures on food items accounted for about [illegible] per cent of total family income in both villages. The marginal propensities to consume food and drink were estimated to be ₦.55 and ₦.61 for Akinlalu and Ilero, indicating that for a ₦1.00 increase in net income, from ₦.[illegible] to ₦.55 of this increase would be consumed in the form of increased consumption of food and drink. The differences between the marginal propensities to consume total food and drink (Table 11) and the marginal propensities to consume home grown food and drink (Table [illegible]) represent the marginal propensities to consume purchased food. Thus

the marginal propensity to purchase food and drink in Ilero is quite small (₦.11), but substantial in Akinlalu (₦.45). That is, per ₦ increase in income farmers in the more prosperous cocoa village are likely to spend a greater proportion of the increase in income on purchases of foodstuffs than in the savannah village.

Table 11. Average values of total food and drink consumed, estimated marginal propensities to consume total food and drink and estimated elasticities of demand for total food and drink in Akinlalu and Ilero. 1970-1971.

		Akinlalu	Ilero
Total food and drink consumed per family	(₦)	282	151
Total food and drink as percentage of net family income	(%)	71	67
Marginal propensity to consume food and drink*	(₦)	.55	.31
Income elasticity of demand for food and drink*		.45	.60

*Regression coefficients significant at the one per cent level.

The income elasticities of demand for total food and drink (again based on the log-log regressions) are presented in Table 11. In both cases the coefficients are less than one, so the consumption of total food and drink represents a diminishing proportion of income as the latter rises. In Akinlalu, a one per cent increase in net income was associated with a .45 per cent

increase in expenditure on food and drink, in Ilero, in the order of .6 per cent. These figures are consistent with those reported elsewhere (e.g. Anthonio, 1966; Clark and Haswell, 1970) for traditional farmers.

In summary, the analysis of the fin nold data collected suggests that in the lower income villages, for a one per cent increase in income, some .6 per cent of this increase would be spent on food and drink, leaving a surplus of .4 per cent of the increase for other forms of expenditure. In Akinlalu -- where average net farm incomes are considerably higher -- for each one per cent increase in income about half of this increase will be spent on food and drink the remainder being available for agricultural or non agricultural investment, for family expenditure savings etc.

10. Total Expenditure and Savings

Estimates of total consumption in Akinlalu and Ilero are listed in Table 14. Total consumption is the sum of family expenditure on food plus the estimated value of farm products consumed on the farm. It excludes expenditure on such items as clothing, education, taxes, entertainment, social obligations. Average total expenditure per family was estimated as nearly ₦450 in Akinlalu and ₦270 in Ilero. The fact that in both villages it was estimated that the average families' expenditure exceeds income by some 10 to 30 per cent indicates that either incomes were underestimated or expenses overestimated (or both).

Table 12. Average values for total consumption estimated for Akinlalu and Ilero, 1970-1971.

		Akinlalu	Ilero
Net income per family	(₦)	399	224
Total consumption per family	(₦)	468	276
Excess of expenditure over income	(₦)	69	70
Consumption as per cent of income	(%)	117	123

The fact that the average small farmer appeared to suffer a net disinvestment over the year leads one to question the accuracy of the data and the findings. Possibly farmers were more willing to divulge their costs than their total incomes. Further, it is possible that the farmer was not fully aware of the incomes (and for that matter, expenditures) of his wives and children.[7] Nevertheless, even allowing for errors in the data, it does appear that the typical smallfarmer in the two villages studied did not generate a cash surplus over and above total family expenditure. Alternatively, for the average smallholder, consumption and other family expenses may expand to account for the total income earned by the smallfarmer, savings for the average smallholder being close to zero.

11. Farmers' Preferences for Investments

Information was also sought by Zuckerman on the farmers' priorities for

using a hypothetical increase in income. As shown in Table 13, farmers generally gave investments in agriculture a low priority. Preferred forms of investment were adding to or constructing houses; educating children; acquiring their own means of transport; trading and milling; and the marriage of themselves or their children. These preferred forms of investment are consistent with those identified by Adegboye [1969]. The form of agricultural investment mentioned in a significant number of cases -- and then usually lower than third priority -- was the hiring of additional farm labor. This was largely confined to the savannah village, Ilero, where farmers have the opportunity to cultivate additional land. The preference was to extend rather than to intensify crop production. By implication, with the current level of technology, supply of inputs and marketing facilities, farmers regard it as more profitable to farm a larger area using current practices than to intensify output through the use of more capital intensive technology.

In summary, it appears that the preferred forms of investment by traditional farmers are not in agriculture, but in non-farm investments. While this undoubtedly reflects profit opportunities as perceived by the farmer it also reflects a widespread preference in the areas studied for trading and for enabling family members to enter non-farm occupations. In consequence, before substantial investments in agriculture by smallholders are likely to occur, improved technology must be clearly profitable when compared to non-farm investments and farming must cease to be regarded as a low status occupation.[8] Given the smallfarmers' liquidity position, family demand for cash, and minimal savings, a substantial proportion of the funds necessary to implement technical change,

must be made available through the formal and the informal channels of credit

Table 13. Farmers first three preferences for investing increases in farm family incomes in Akinlalu and Ilero.

Investment Opportunity	First		Second		Third	
	Akinlalu	Ilero	Akinlalu	Ilero	Akinlalu	Ilero
Housing	22	18	11	8	-	3
Education	4	7	9	9	6	5
Marriage	2	-	7	1	4	-
Transport	-	3	3	4	4	6
Trading/milling	5	4	3	8	9	5
Agriculture	-	1	-	3	3	5
Others*	-	-	-	-	7	9

*Includes clothing, travel, radios, sewing machines, medical care, reduction of debts.

12 Summary

The average family in the sample of farms surveyed in Akinlalu and Ilero consisted of six or seven people, cultivating on average between 1.6 to 1.7 hectares of land. Male members of the family provided some 80 per cent of the total labor input to farming with hired labor accounting for 8 to 10 per cent of total labor inputs. The average annual input of labor in the cocoa village at 208 days per hectare was significantly higher than the 163 days per hectare recorded

for the village in the derived savannah zone. In both villages, labor input per hectare diminished as farm size increased, farmers with larger farms did not farm their land as intensively as farmers with smaller cultivated areas.

The recorded labor data showed that the time spent in weeding accounted for over half of total labor inputs. Thus every effort should be made to develop substitutes for hand weeding which are technically and economically acceptable to the smallfarmer (e.g. minimum tillage, live mulches, chemical weed control).

The net farm income estimated for Akinlalu was ₦?97 and for the village located in the derived savannah zone, ₦185 in 1970-1971. In the forest zone where a profitable cash crop in the form of cocoa exists, net income per hectare and per unit of labor were ₦62 and ₦.14 higher, respectively, than for the farms in the savannah zones. The net family income in Akinlalu was estimated to be ₦3?9, and in Ilero ₦?24 in 1970-1971. Non-farm sources of income contributed substantially to the income of the farm family.

The gross farm income in both villages was significantly related to farm size and agricultural expenditure. The marginal value of land in the cocoa zone was estimated to be ₦66 per hectare, and in the derived savannah zone, ₦33 per hectare. While in Ilero a significant relationship was observed between family labor inputs and gross farm income, this was not the case in Akinlalu.

The value of food consumed was positively correlated with net family income. The value of home grown food consumed on the farm represented 19 and

[illegible] per cent of net farm income in Akinlalu and Ilero respectively. The total value of food and drink consumed by the average farm family in both villages was close to 70 per cent of net family income. The income elasticities of demand for total food and drink were less than one in both villages indicating that the total expenditure on food and drink accounted for a smaller and smaller proportion of total income as income increased.

Average recorded total expenditures exceeded average estimated net farm income in both villages. While this suggests that not all income items were recorded, it does appear that the average smallfarmer's asset position did not leave him with a substantial cash surplus after he has met family living expenses. In consequence, any substantial investment necessary for the adoption of capital intensive agricultural technology will have to initially be supplied through external sources of credit. For such technology to be relevant requires that it is more profitable to the farmer than alternative off-farm investment opportunities. Indeed, given the existing levels of agricultural technology, farmers exhibit a marked preference for investing increases in farm income (after making allowances for increases in consumption) in non-agricultural activities.

10. Acknowledgements

The data analysed in this paper was collected by P.S. Zuckerman while he was a member of the staff of IITA. Helpful comments were made by B.M. Jellema, J. Lagemann and L.B. Williams on an earlier draft of this paper.

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FOOTNOTES

1. In this study, following Spencer [1972] standard man equivalents have been used. For most of the jobs the women and older children perform (weeding and harvesting) they are just as efficient as men.

2. These figures are average and not marginal returns per day of labor input. Presumably diminishing returns prevail with respect to labor, hence the value of an extra day of family labor would be less than the figure quoted.

3. Upton [1970] has demonstrated a way in which managerial capacity can be approximated and included in whole farm production functions.

4. The average distribution of land between cocoa and food crops in Akinlalu is about two thirds cocoa to one third food crops. In Ilero, all the land would be under food crops.

5. Upton [1967, p.38] discusses the assumptions implicit in estimating marginal propensities to consume by this method.

6. Clark and Haswell [1970, ch. 11] discuss the assumptions underlying these models of consumption.

7. If incomes were underestimated, then the marginal propensities to consume and the income elasticities of demand derived would be over-stimated. However, Friedman [1957] has shown that the use of cross sectional data to estimate these parameters will result in estimates which tend to under estimate income elasticities and marginal propensities to consume commodities. (Friedman explained this in terms of the "permanent income" hypothesis). Thus, the results presented in this paper -- if incomes were underestimated -- are probably not as large an overestimate as may first appear to be the case.

8. Presumably there is a positive casual relationship between highly profitable forms of farming and the status of being a farmer. In a recent survey of 155 family farm units (who grow tobacco under contract to the Nigerian Tobacco Company) conducted by the author, it was found that over 30 per cent of the farmers interviewed were less than 35 years old. Such a large proportion of young farmers is not typical of the general age distribution of smallholders. In consequence, as argued by many authors [e.g. Brown, 1970] providing that a highly profitable agricultural innovation exists (and other pre-conditions are met, e.g. organized marketing channels, credit and inputs available as, when, and where required) young men are willing to enter farming as a business.