EXPLAINING USE OR NON-USE OF FARM CREDIT BY SMALL SCALE FARMERS IN THE NYERI DISTRICT OF KENYA

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I. Introduction

The Kenyan economy has traditionally depended on its agricultural sector. The agricultural contribution to the gross domestic production (G.D.P.) has declined over time but agriculture remains the leading industry. For example, agriculture contributed 35 percent and 31 per- cent of G.D.P. in the years 1965 and 1987, respectively. During the same period, industry and manufactures recorded only a 1 percent increase in dollar contribution to G.D.P. from 29 percent to 30 percent, (Republic of Kenya, Economic Survey).

Agricultural development in Kenya is imperative to generate needed raw materials and resources for other sectors of the Kenyan economy. Development is also needed to improve the incomes of farmers, a majority of whom are small scale farmers operating less than twenty acres of land and earning only marginal incomes.

Small farms may be defined in a variety of ways such as hectares of land operated by a household, the value of farm production, the level of capital investment per pro- duction unit, and the number of livestock raised by the production unit. The United States Department of Agricul- ture definition includes all farm families whose family net income from all sources is below the median non- metropolitan income of the state, who depend on farming for a significant though not necessarily a majority of their income, and whose family members provide most of the labour and management (Carlin and

Crecink). A defini- tion of farm size should consider resource endowments, the level of net farm income realized relative to the resources employed, the farm ownership pattern, and the degree of specialization. In Kenya, as with many other developing countries, land is the basic agricultural resource and amount available dictates the amount of labor and capital utilized in farming acti- vities. It is therefore appropriate to define small farms based on amount of land held and operated. In Kenya, agricultural land holdings of less than twelve hectares (30 acres) are considered small farms (Republic of Kenya, Statistical Abstract, 1986). Such farms are operated by the farm family with limited capital investment and employ mainly a few seasonal farm laborers. These farmers will raise a variety of crops and livestock and are more likely to consume a larger proportion of their farm pro- duce than large scale farmers. About 74 percent of the 1.5 million small farm holdings in Kenya operate an aver- age of less than three hectares of land. Average smal- lholder investment per farm per year in Kenya by 1982 was below Kshs. 10,000 or approximately $917 in 1982 dollars, (Republic of Kenya, Statistical Abstract).

The importance of small-scale farmers in Kenya cannot be over-emphasized. For example, the percentage share of the value of gross marketed production by small farms rose from 18 percent to 19 percent in the late 1950s to 55 percent in 1975 and thereafter stabilized at 51 per- cent in the early

1980s.

Similarly, the average annual rate of growth of marketed output between 1955 and 1976 for five major crops: tea, coffee, pyrethrum, sugarcane, and wheat was much higher on small farms than on large farms. This rate of growth in the small and large farms was 21.3 percent com- pared to 5.2 percent for coffee, 30.3 percent compared to 7.3 percent for tea, 33.5 percent compared to a negative 3.5 percent for pyrethrum, 33.1 percent compared to 9.1 percent for sugarcane, and 65.7 percent compared to 2.0 percent for wheat respectively (Livingstone). Table 1 compares value of gross marketed output from large and small farms over the period 1954 to 1984.

Livingstone uses eight hectares to define the bound- ary for small and large farms and therefore above figures are likely to change positively for small farmers if the twelve hectare limit on small farm size used in the Republic of Kenya documents is considered. Small farms are defined in this research project to be twelve hectares or less.

Empirical evidence tends to show an inverse relationship between farm size and productivity per unit of land in less developed countries (Heyer). In 1976-77 for example, gross output per hectare for dif- ferent farm sizes showed that farms between 0.5 and 1.00 hectare averaged Kshs. 2,961 per hectare with gross out- put decreasing with an increase in hectarage to Kshs. 495 per hectare for farms between 5.00

Table 1. VALUE OF GROSS MARKETED OUTPUT FROM LARGE AND SMALL FARMS 1954-1984 (MILLIONS OF KENYA POUNDS).

YEAR	LARGE FARMS*	SMALL FARMS	TOTAL	% SHARE OF SMALL FARMS
1954	27.3	6.0	33.3	18.0
1955	32.8	5.1	37.9	13.5
1956	32.6	5.9	38.5	15.3
1957	32.4	6.9	39.3	17.7
1958	33.4	7.6	41.0	18.5
1959	33.9	8.4	42.3	19.
1960	33.7	9.5	47.2	20.1
1961	35.7	10.4	46.1	22.5
1962	37.1	10.6	47.7	22.2
1963	40.7	11.3	52.0	21.7
1964	35.8	24.6	60.4	40.7
1965	33.3	23.8	57.2	41.6
1966	36.0	32.7	68.8	47.5
1967	32.9	34.1	66.9	51.0
1968	34.4	35.8	70.2	51.0
1969	37.9	38.3	76.2	50.3
1970	41.2	44.2	85.4	51.7
1971	42.1	44.6	86.7	51.4
1972	50.3	55.6	105.9	52.5
1973	60.0	63.3	123.3	51.3
1974	73.4	75.0	148.4	50.6
1975	71.8	90.1	162.0	55.6
1976	122.1	128.0	250.1	51.2
1977	206.0	208.5	414.5	50.3
1978	147.2	178.6	325.8	54.8
1979	148.2	165.2	313.4	52.7
1980	168.8	184.5	353.3	52.2
1981	178.6	208.3	386.9	53.8
1982	216.7	232.2	448.9	51.7
1983	271.3	284.1	555.4	51.2
1984	386.2	402.5	788.8	51.0

Source: Republic of Kenya, Central Bureau of Statistics Economic Surveys and Statistical Abstracts.

* Bureau considers 12.0 Ha. or more of land to be large.

and 8.00 hectares (Livingstone). This evidence may be attributed to the use by small farmers of a high level of family labor input whose opportunity cost is near zero due to scarcity of off-farm employment opportunities. It may be that managerial skill requirements by small farm operators are easily met compared to those required to run large farms. It is also possible that small farmers grow and raise high value crop and live- stock enterprises. These advantages may have lead policy makers to give financial and technical

assistance for the subdivision of former large scale mixed farms. The number of small farm holdings continues to rise and the average size of small scale farms to decrease, due mainly to a high population growth rate of approximately 4 percent per year and the continued subdivision of formerly large scale farms. A Central Bureau of Statistics integrated rural survey carried out in 1974 through 1975 revealed that 206,000 holdings, which accounted for 14 percent of all holdings under 20 hectares, were below 0.5 hectares. A second study carried out in 1976 through 1977 showed 508,000 holdings, accounting for 30% of the holdings, were below 0.5 hectares (Livingstone). In the Nyeri dis- trict, estimated availability of good agricultural land per person declined from 0.44 hectare per person 1n 1969 to 0.33 hectare in 1979 and further to 0.25 hectare in 1989 (Livingstone). Further, the Republic of Kenya Stat- istical Abstract (1986), reports a doubling of farms below 19 hectares from 469,000 holdings

in 1977 to 961,000 holdings 1n 1984. Therefore providing the means to adopt intensive technologies to small scale farmers will improve the quality of their input packages.

Past national development plans have identified and devised systems to increase yields on small farms by increasing labour input (Republic of Kenya, Development Plan). However, there remains room for increased agricultural productivity through increased use and efficient allocation of capital inputs. In particular, small farms can improve productivity through increased use of purchased inputs such as fertilizers, agricultural chemi- cals, and improved seed and veterinary drugs. Increased use of agricultural credit will make the use of these inputs possible. For the adequate and timely availability of these technological inputs, an efficient market- oriented input supply system will also be required.

In 1989, Kenya launched a "District Development Loans Fund",(D.D.L.F.), to provide loan funds to individuals and groups of individuals in rural areas. The funds are intended to cover the initial investment and working cap- ital requirements needed by small farms and other small firm operators. The fund will be able to accept some applications which commercial banks would deem to be too small to qualify for their loans.

Kenya is made up of seven rural provinces each of which is divided into districts. There are forty one dis- tricts in

total. This research undertaking will focus on Nyeri district located in Central Province (see section III). Nyeri district is itself divided into six agricul- tural divisions.

II. The problem

To improve their earning potential, small scale farmers will have to use more capital-intensive technologies. For many small farmers, credit is a prerequisite to the procurement and use of other inputs such as fertilizers, chemicals, tools, and services. The marginal contribution of farm credit should be to bring input use levels closer to the levels recommended by research and agricultural extension officers, thereby increasing output. If small farmers wish to expand or realize increased farm produc- tivity they may also need credit. Held and Helmers (1980) showed a positive relationship between debt and farm growth over time. Wolgin (1975) found that lack of credit was a major bottleneck to increasing small farm producti- vity in Kenya. Morna, et. al also concluded that small farmers in Kenya have the potential to improve farm pro- ductivity and increase in size if increased farm credit were available.

Empirical evidence indicates that only a small percentage of farmers in Kenya use farm credit. For example, by 1975 only about 12 percent of small farmers in Kenya were using farm credit 60 percent of which was supplied by public financial institutions and the rest came from private sources

(Bathrick; Donald). Also, based on provi- sional figures contained in the Republic of Kenya Statis- tical Abstracts small farmers received only 22 percent of the total new agricultural credit issued in the 1983/84 season. It is estimated that only 5 percent of farmers in Africa and 15 percent of farmers in Asia and Latin Amer- ica have access to formal credit (Braverman and Guasch). Kenyan farmers are considered better participants in the credit market when compared to the rest of Africa. The Kenya cooperative savings scheme initiated in 1970 to serve small scale coffee farmers has contributed to their high participation rates (Von Pischke). In Jamaica com- mercial banks are the largest single farm credit source, but a greater percentange of bank credit goes to medium sized and larger farmers who are likely to have a better credit rating and who pose limited lender risks (Graham and Bourne). At times small farmers have been considered to be bad risks by both public and private lending insti- tutions, which are often reluctant to supply agricultural credit to small scale farmers except under the most exhaustive scrutiny (Heyer, Maitha, and Senga). Between 1975 and 1982, as shown in table 2, the amount of agri- cultural credit issued to small scale farmers in Kenya has been small and has tended to decline. In India the share of institutional loans issued to small farmers increased after measures to encourage small farmer participation in the credit market were initiated by the Bank of India (D'Mello).

Table 2. VALUE OF AGRICULTURAL CREDIT ISSUED TO SMALL SCALE FARMERS IN KENYA, 1974/75-1981/82*.

Year	Kenya Pounds.	US$(Nominal).
1974/75	2,532,000	348,000
1975/76	2.812,000	452,380
1976/77	2,462,000	370,530
1977/78	3,119,000	390,950
1978/79	2,675,000	353,000
1979/80	1,381,000	185,000
1980/81	1,814,000	221,300
1981/82	2,276,000	229,900

* Loan data were no longer seperated after 1981/82.

Source: Kenya's Central Bureau of Statistics. Statistical Abstracts. The exchange rate used is the average of annual means reported in the F.A.O. Trade Yearbooks.

Several social-economic, and/or institutional factors may explain why only a few small scale farmers in Kenya are using credit. Leading credit institutions may be offering unacceptable loan terms to small scale farmers therefore making the use of credit unprofitable. These terms would include: credit rationing due to inadequate amounts of lending funds; delays in credit approval; inadequate loan evaluation and subsequent supervision; collateral requirements which necessitate possession of rights to land; distance to credit market centers which is aggravated by lack of reliable transport; inflexibilities in loan repayment scheduling, and existence of minimum amounts that an an individual farmer must borrow if he wishes to borrow any funds at all (Barry).

However, it is clear from table 3 that the cost of farm credit by itself should not be a barrier to its use. Table 3 shows that in real terms interest on farm credit issued by the two main institutions was negative during the period 1970 to 1982. Subsidized credit may lead to credit rationing thereby favoring large farmers who have greater access to credit institutions (Braverman & Guasch). There is need to determine the main social and economic variables that would otherwise explain use or non-use of farm credit by small farmers. Suggestions to improve the efficiency with which farm credit is used and delivered to small scale farmers can then be made.

Use of credit may mean additional risks to the small farmers who already face large production, market, and technological risks due to: uncertain weather conditions; inadequate markets for farm produce and farm inputs; and inappropriate use of large scale farm technologies. These added risks can inhibit increased use of farm credit. Other factors that may explain use or non-use of farm credit include the age of the farmer, the number of farm income dependents, the magnitude of net farm income realized, the farmer's educational status, and the type of farming system.

In the past, farmers have experienced delays in getting their loans approved and in getting shipments of inputs such as fertilizers, and in receiving services such as veterinary and extension services at critical seasons. Common to both small and large farms are the chronic delays in payments for the produce marketed through marketing boards and cooperative societies. These delays create a financial burden to small scale farmers with meager savings, who depend on cash to pay for regu- lar inputs and services such as labour and livestock feed as well as meeting other family cash obligations. Prob- lems with delays in payment for farm produce can be alleviated by timely approval of farm credit. However, mere availability of farm credit is of no consequence if the farmers are unable to procure the needed inputs due to their unavailability and/or inaccessibility.

Table 3. EXPOST REAL INTEREST RATES IN KENYA*

Year	Commercial Banks (6 Months)	Agric. Finance Corporation
1970	+ 0.3	+ 4.0
1971	0.0	+ 3.6
1972	- 5.9	- 2.5
1973	- 12.5	- 10.8
1974	- 18.0	- 16.0
1975	- 6.2	- 3.9
1976	- 16.9	- 14.1
1977	- 11.1	- 8.1
1978	- 0.6	+ 2.8
1979	- 8.5	- 5.4
1980	- 5.2	- 3.2
1981	- 3.5	- 2.6
1982	+ 2.5	+ 1.4

Source: Extracted from Table 1. in Hanson & Neal.

* Expost loan interest rates reflect inflation rate six months forward from December 31st.

III. The Study Area

The research undertaking will be based in Nyeri district of the Central Province of the Republic of Kenya. The district is located on the southern slopes of Mt. Kenya. It is characterized by deep volcanic soils, moder- ate rainfall and high population density. Mean annual rainfall in Nyeri town is close to 1,000 millimeters. The last population census conducted in 1979 shows Nyeri to have a population density of 148 persons per square kilometer which translates to about 0.68 (1.7 acres) hec- tares of total land area per person (Republic of Kenya, Statistical Abstract). The data for the latest census of 1989 when available may indicate increased land pressure.

The district was selected for the following reasons:

(a). It is characterized by relatively stable small- scale farming systems. The small-scale land adjudication and registration process in Nyeri started in 1942 and was completed by the early 1950s. These well established small farming systems are expected to be rich in data and the farmers to possess a lot of experience in operating and financing small scale farm enterprises.

(b) The district has a wide range of farm sizes rang- ing from 0.1 hectares to more than 20 hectares per house- hold. If small scale farms are defined as those below twelve hectares then over 90 percent of all farms in the district can be considered small farms. This is typical in Kenya.

(c). The district raises a rich variety of crops and livestock enterprises. These include coffee, tea, pota- toes, maize beans, maize/bean mixed cropping, horticultu- ral crops, dairy, beef, poultry and pigs. This variety of crops and livestock is essential particularly in account- ing for farmer preferences for farm enterprises based on available crop and livestock specific credit schemes.

(d). The district is logistically convenient for con- ducting research. Many farmers are accessible and are located relatively close to one another. This saves time of travel and makes it possible to deal with a large num- ber of farmers during the limited study time available.

(e). The area has diverse farm credit sources. The area is served by two branches of the Agricultural Finance Corporation, which is the major agricultural credit institution in the country, several cooperative societies, commercial banks, insurance companies, farm input dealers and possibly an informal credit market served by moneylenders.

(f). The district has several well accessible market centres and local cooperative society stores where the farmers can purchase needed agricultural inputs. This is not the case with much of the rest of Kenya.

IV. Research Project Objective

To determine the extent to which certain social and economic variables explain farm credit borrowing poten- tial

by small scale farmers and explain why small scale farmers are or are not using farm credit in Nyeri dis- trict, Kenya.

V. Research Hypotheses

1. Increased net farm incomes lead small farmers to use more farm credit.

2. There is a positive relationship between farmer's educational background and use of available farm credit.

3. There is an inverse relationship between distance to the credit agent's offices and credit use.

4. Male haed of households use more farm credit than do female head of households.

5. Older small farmers use less farm credit.

6. Their is a positive relationship between availabil- ity of purchased inputs and credit use.

7. Delays in credit approval lead farmer to use less farm credit.

VI. The Model Specification

There are three alternative but related models that may be used to analyze use or non-use of farm credit by small scale farmers. These are the linear probability model, the logit model, and the probit model. In each of these three econometric models the dependent variable is binary taking two discrete values (usually a 1 and a 0). For example, we could assign a 1 to the dependent vari- able if the small scale farmer used farm credit and a 0 if he did not. Each of

these three models are easly esti- mated using regression techniques.

The linear probability model (LPM) specified as $Y_i = b_iX_i + u_i$ and is interpreted as the probability, Y_i, that the farmer used credit given the explanatory variable, X_i has the following properties:

$E(u_i) = 0$, and $E(Y_i/X_i) = b_iX_i$.

The linear probability model has some weaknesses. Two major problems with this model are that the estimated probabilities can lie outside the admissible range of zero and one, and that the model is plagued by heterosce- dasticity. That is, the variance of the error term is not constant across observations. Due to these problems the LPM model is less preferred to the probit and the logit models (Maddala, Gujarati).

The probit model $Y^*j = b_o + b_jX_j + u_j$ where Y^*_j is unobservable and $Y = 1$ if $Y^*_j > 0$, and $Y = 0$ otherwise.

It has the property that u_j are independently and nor- mally distributed with mean zero and variance σ^2. The probit and the logit models differ only in the specifica- tion of the error term, u_j. In the case of the logit model u_j follows a logistic distribution. Since the logistic and the cumulative normal distributions are sim-ilar, results obtained from estimating a logit or a pro- bit model are similar. The estimates are, however, not comparable, since their variances are different. The standard normal probit has

variance equal to 1 but the logistic function has variance equal to $\pi^2/3$. To make the variances of the logistic and the probit distribu- tions comparable Amemiya has suggested multiplying the coefficients of the logit by a constant, $\sqrt{3}/\pi = 0.625$ first. It therefore isn't necessary to estimate both functions since estimates of one may be used to derive estimates of the other function. A logit model will be estimated and its coefficients used to derive additional estimates for probit if the data coolected indicate that the error term follows a normal distribution. The esti- mated model will reveal how the selected independent variables explain use and/or non-use of farm credit. The model will be analyzed using regression techniques with the dependent variable being the log ratio of the proba- bilities that the farmer used/did not use farm credit in the past season. The independent variables will include, ecological zone (marginal, medium, high potential based on rainfall and temperature), age of the head of house- hold, formal educational level of head of household, dis- tance to credit office, whether farmer has nonfarm income, whether head of household attended farmer train- ing centre (Wambugu F.T.C.) during the last five years, average number of visits per year farmer receives from agricultural extension officers, farm size (ha.), profi- tability (net farm income), whether farmer specializes in crops or livestock, and whether female or male is head of household.

VII. Empirical Studies

Access to loans has been found to be a significant explanatory variable for the adoption of improved farming techniques in India where farmers ability to use optimal levels of improved inputs such as fertilizer and high yielding varieties increased with higher levels of credit (David and Meyer). Baker and Bhargava also found that unrestricted (in terms of use) loans issued to farmers nearly doubled the area planted to high yielding vari- eties and generated increased net cash flows in India.

Sonka and Dixon using a logit model show that the farmer's liquidity position is an important factor in obtaining a loan. Small farmers are likely to be con- strained in liquid assets and therefore stand less chance of securing a loan from formal credit institu- tions. A survey conducted in Nigeria identified household income, years of formal education, gender, and awareness of the existence of rural bank branch as important deter- minants of farmers use, in terms of saving deposits, of the bank system. Household income was by far the most important variable. Similar results of a survey conducted in Ghana revealed that income is the key economic vari- able in determining farmer participation in the banking system (Okorie). Similarly, a study conducted in China using a probit model showed that of the over twenty vari- ables included in the model only farm income and bank savings were significant variables at the 5

percent level in determining the probability of the farmer being credit constrained (Feder, Lau, Lin, and Luo).

A study conducted in Njoro, Kenya, an area which was until recently 100 percent large scale farms, and where the new small farmers continue to use large scale farming technology, showed that small farmers were less produc- tive than larger farmers. Large scale farmers in Njoro also had credit constraints and access to more capital resources, including credit, would lead greater producti- vity on large farms (Carter, and Wiebe).

VIII. The Sampling Plan

A total of 100 family farms occupying twelve hectares or less per farm will be surveyed. Farms will be selected randomly from a list of farm holdings in each of the six agricultural divisions in Nyeri district, Kieni East, Kieni West, Tetu, Othaya, Mukurweini, and Mathira. The number of farms selected from each division will be pro- portional to its size as given by the number of holdings. A stratified sampling plan is therefore to be used, whereby the six agricultural divisions will represent the strata. The overall sample is a stratified sample because sample units in each strata will be selected in a random manner (Cochran). From each stratum independent samples will be drawn randomly. Drawing independent samples from each stratum will ensure that the sample will account for the diversity of the

cropping systems in the district which tend to be location specific. One of the reasons for using stratified sampling is that it enables the division of a heterogeneous population into relatively homogeneous strata and therefore facilitates use of smaller samples overall (Cyert and Davidson).

The sample size for each strata will be $N_i = w_i * T$ where w_i is the stratum weight and T is the overall sample (100 farmers). The stratum weight for each strata will be derived by dividing the area in hectares in each division by the total small scale farming area. For example, the Kieni East stratum weight will be $w_1 = 436/2572.5 = 0.17$. In this case a sample, N_1 , will be drawn from Kieni East such that $N_1 = 0.17*100 = 17$ farm- ers. From a list of farmers in Kieni East division (first stratum) a simple random sample of seventeen farms will be selected using a table of random numbers. Since the sample will be drawn without replacement any number in the random number table which has been drawn previously would be ignored (Cochran). The number of farmers to be interviewed from the other five divisions calculated in the same manner as for Kieni East are Kieni West = 18 farmers, Tetu = 7 farmers, Othaya = 44 farmers, Mukur- weini = 5 farmers, and in Mathira 9 farmers will be interviewed. Personal interviews will be conducted by the researcher himself. The researcher will seek assistance from local agricultural extension officers in identifying and reaching farmers in their respective divisions. Table 4. shows the

Table 4. DISTRIBUTION OF SMALL FARMS IN NYERI DISTRICT.

DIVISION	ADMINISTRATIVE LOCATIONS.	AREA IN HA.	AGRIC. HOLDING/ HOUSEHOLD (HA).	#FARMS SELECTED
KIENI EAST	3	436	4.83	17
KIENI WEST	5	456	6.97	18
TETU	4	169.5	0.97	7
OTHAYA	4	1134	1.10	44
MUKURWEINI	5	143	1.20	5
MATHIRA	6	234	0.96	9
TOAL/AVERAGE	27	2572.5*	1.8	100

SOURCE.1989 Farm management guidelines, Nyeri district.

* Total area includes only farms that are 12 Ha. or less.

relative size of each division, the number of farm holdings in each division, and the number of farmers to be selected for interviews from each division.

The survey instrument will pretested on twenty farm- ers in Njoro division, Nakuru district (near Egerton University) and questions adjusted, and/or added before being applied in Nyeri district. The questions listed on the survey instrument are aimed at soliciting farmer's responses to certain social, logistic, and economic vari- ables that are considered important determinants of farmer's use or non-use of farm credit. The survey instrument also seeks more information than alluded to by the project's objectives so that the researcher may get a good overall impression of the small scale farming envi- ronment. Supplementary information obtained from adminis- tration of the entire survey instrument will not only be useful in explaining deviations from expected model
results but will be useful for enriching the final presentation. For example. from questions 4,5,6 measures of farm size derived will be related to credit use to deter- mine the relationship between productivity and level of credit use.

IX. The Survey Instrument

FARM CREDIT USE QUESTIONNAIRE

LOCATION OF THE SURVEY NYERI DISTRICT

DATE QUESTIONNAIRE WAS ADMINISTERED_____

SERIAL NUMBER OF SURVEY INSTRUMENT _____

ENUMERATOR CODE _____

Name of the farmer_____

Agricultural Division _____

Agricultural Location_____

"" Sub-location_____

Size of the farm _____hectares

1. Ownership status

(a) Does the farmer have title to the land he/she operates? Yes _____ No _____

(b) How long has the farmer been operating the farm?

_____years

2. Family status

(a) How many persons live on the farm?_____

(b) Number of persons in (a) dependent on farm income

_____

(c) Gender of the head of household Male____ Female_____

(d) What is the age of the head of household? _____years

3. Allocation of land holding

Total cropland _____ha.

Pastures land _____ha.

Other (homestead,paths,forest,water) _____ha

4. Crops grown on the farm

(a). For each crop listed below provide the necessary information for the year 1990.

	Crop					
	Beans	Potatoes	Maize	Coffee	Tea	Pyrethrum
Hectarage						
Incectcide-per HA						
Manure, t/ha						
Nitrogen, kg/ha						
P_2O_5, ""						
Labor, Mdys/ha						
- Hired						
- Family						
Machinery, hrs/ha						
- Own						
- Hired						
Seed, kgs/ha						
Herbicide, L/kg/h						
Marketing/Transp						
Yield, kgs/ha						
Average Price						

(b). For each of the livestock listed below provide the following information.

Livestock type	Herd size	Calving interval(dys/laying %	Average Litter size	Deaths	Milk kgs	Offtake
Beef						
Dairy						
Pigs						
Sheep						
Goats						
Poultry						
Rabbits						

5. Laboring

For each category of persons listed indicate their employment status.

Member of household	Farm full time	Partly farm/ Partly off-farm.	Full time off-farm.
Husband			
Wife			
Other			
1st			
2nd			

6. Education status

What is the formal educational level of the head of household? Indicate last grade attended, zero if does

not have formal education. _____

7. Income status

Provide the following income and expense information on your three main farm enterprises, and an overall estimate of your farm's net farm income.

Income / Expense	Enterprise		
	1	2	3
Sales (Kshs.)			
Value of produce consumed at home			
Value of produce given away to others			
Value of produce fed to livestock			
Value of produce in store on 1/1/90			
Value of produce in Store on 1/12/90			
Yield in 1990			
Price received			
Cost of seed			
Cost of fertilizers			
Cost of insectcides			
Cost of Herbicides			
Cost of labor hired			

Cost of machinery services hired			
Transportation and market costs			
Purchased feeds			
Veterinary expense			
% Contribution to farm income	%	%	%

Overall estimate of net farm income_____

8. Credit status

Did the farmer use credit in 1990 to finance farm operations?

Yes_____ No_____

Did the farmer use credit to purchase breeding/capital stock?

Yes_____No_____

Did the farmer receive other non-farm credit?

Yes_____No_____

If the farmer applied for credit and got only part of the funds applied for, ask him why he did not get all the credit applied for._____

_____

If the farmer did not apply for credit in 1990 ask him why he did not do so.

Possible answers:

(i) Has revolving credit arrangement_____

(ii) Did not need debt financing_____

(iii) Does not usually like borrowing _____

(iv) Defaulted 1989 credit_____

(v)Land title was mortgaged_____

(vi) Rest of family disapproved _____

(vii) Other _____

9. Credit sources

The following is a list of possible credit sources. Indicate the amount of credit funds borrowed, credit purpose, and average interest charged.

SOURCE	AMOUNT	ACTIVITY FINANCED	YEARS	AVERAGE INTEREST RATE, %
Kenya commercial bank = 1	_____	_____	_____	_____
Standard bank (K) =2	_____	_____	_____	_____
Barclays bank (K) =3	_____	_____	_____	_____
National bank of Kenya = 4	_____	_____	_____	_____
Co-operative bank of K =5	_____	_____	_____	_____
Other commercial bank = 6	_____	_____	_____	_____
Agricultural finance corp.= 7	_____	_____	_____	_____
District development fund= 8	_____	_____	_____	_____
Produce marketing board =9	_____	_____	_____	_____
Input marketing firm =10	_____	_____	_____	_____
Cooperative society =11	_____	_____	_____	_____
Insurance firm =12	_____	_____	_____	_____
Money lenders =13	_____	_____	_____	_____

Friends and relatives = 14 _____ _____ _____ _____

Other (specify) = 15 _____ _____ _____ _____

10. More on farm credit

(a). Did the farmer apply for credit and rejected in 1990?

Yes_____ No _____

If yes, why was credit denied? _____

Did the farmer secure needed funds elsewhere?

Yes_____ No _____

If yes, from where?

(i) Used own savings _____

(ii) Sold livestock _____

(iii) sold produce stored for food needs _____

(iv) Other (specify) _____

How long did the farmer have to wait between application for credit and final approval in 1990?

(i) Less than one month _____

(ii) One to two months_____

(iii) Two to three months _____

(iv) more than three months _____

(b). Credit availability,

Was farm credit available to the farmer in 1990?_____

Does the farmer think that farm credit is more or less available now than five years ago?

(i) More available now _____

(ii) Was more available five years ago _____

(iii) Same as before _____

(iv) Farmer has no idea _____

For the following problems associated with credit place a

1 - if the farmer feels it was a major problem in 1990

2 -if the farmer feels it was a minor problem, and a

3 -if the farmer feels that it was no problem at at all.

(c).Credit problems,

(i) Inadequate credit _____

(ii) High interest rate _____

(iii) Loan secured on registered land only _____

(iv) Credit was not on time _____

(v) Require repayments to start immediately _____

(vi) A loan guarantor required _____

(vii) Term of the loan too short relative to life of the project. _____

(viii) Credit office is too far away _____

(ix) Require down payment and application fee _____

(x) Too much time spent away from farm during loan application process. _____

(xi) Credit officers intimidating _____

(xii) Unnecessary personal disclosures _____

(xiii) Farmer has no idea (uses no credit)_____

(xiv) " " " " " (uses credit)_____

(xv) Other (ask farmer to describe) _____

(d).Credit default,

Did the farmer default in his payment of 1990 loan installments? Default means that the farmer for whatever reason did not repay all loan principal and interest due in 1990.

Yes_____ No_____

If yes, how much money was in default?

Kshs._____ What % of installments due was in default? _____%

Has the farmer defaulted in loan repayments prior to 1990? Yes_____ Never_____

Did the farmer seek for loan repayment rescheduling?

Yes_____ No _____

Were the loan instalments rescheduled?

Yes _____ No _____

When is the last time the farmer defaulted in loan repayments? Year _____

11. Logistics

(a) Where does the farmer ordinarily purchase farm inputs?

Name of town/centre _____

(b) where does he/she sell farm produce?

Name of market centre_____ or

Name of market outlet _____

(c) How far are the following market centres from the

farm?

(i) produce market centre _____miles

(ii) input market centre _____miles

(iii) A.F.C. offices _____miles

(iv) Co-op offices _____miles

12. Availability of purchased inputs and credit

For each main crop and livestock on the farm provide the following information,

Crop_____

(a). Was seed available for purhase at planting time in 1990?

Yes_____No _____ No idea(used own seed)_____

If yes, did the farmer get all the seed needed?

Yes_____No_____

If no did the farmer have to delay planting?

Yes_____days/weeks/months No_____(planted only part of field).

(b). Was the farmer able to get the right fertilizer formulation in 1990?

P_2O_5 Yes _____ No _____

Nitrogen Yes_____ No _____

Was fertilizer available when needed?

Planting. Yes _____ No _____

Topdressing. Yes _____ No _____

Farmer uses farm yard manure _____

Was the fertilizer available for purchase in

adequate amounts in 1990? Yes_____ no_____

If no, what % of fertilizer needed was available_____%

(c). Were herbicides available for purchase in 1990?

Yes_____No _____ No idea(used none)_____

If yes, did the farmer get all the herbicides needed?

Yes_____No_____

If no did the farmer have to delay spraying?

Yes_____days/weeks/months No_____(sprayed % of recommended dosage).

(d). Were insecticides available for purchase in 1990?

Yes_____No _____ No idea(used none)_____

If yes, did the farmer get all the insecticides needed?

Yes_____No_____

If no did the farmer have to delay spraying?

Yes_____days/weeks/months No_____(sprayed % of recommended dosage).

(e). Was hired labor available when needed in 1990?

Yes_____No _____ No idea(used none)_____

If yes, did the farmer get all the labor services required? Yes_____ No_____

If no did the farmer get help from relative/friends?

Yes_____ No_____.

If no what did the farmer do? _____

_____

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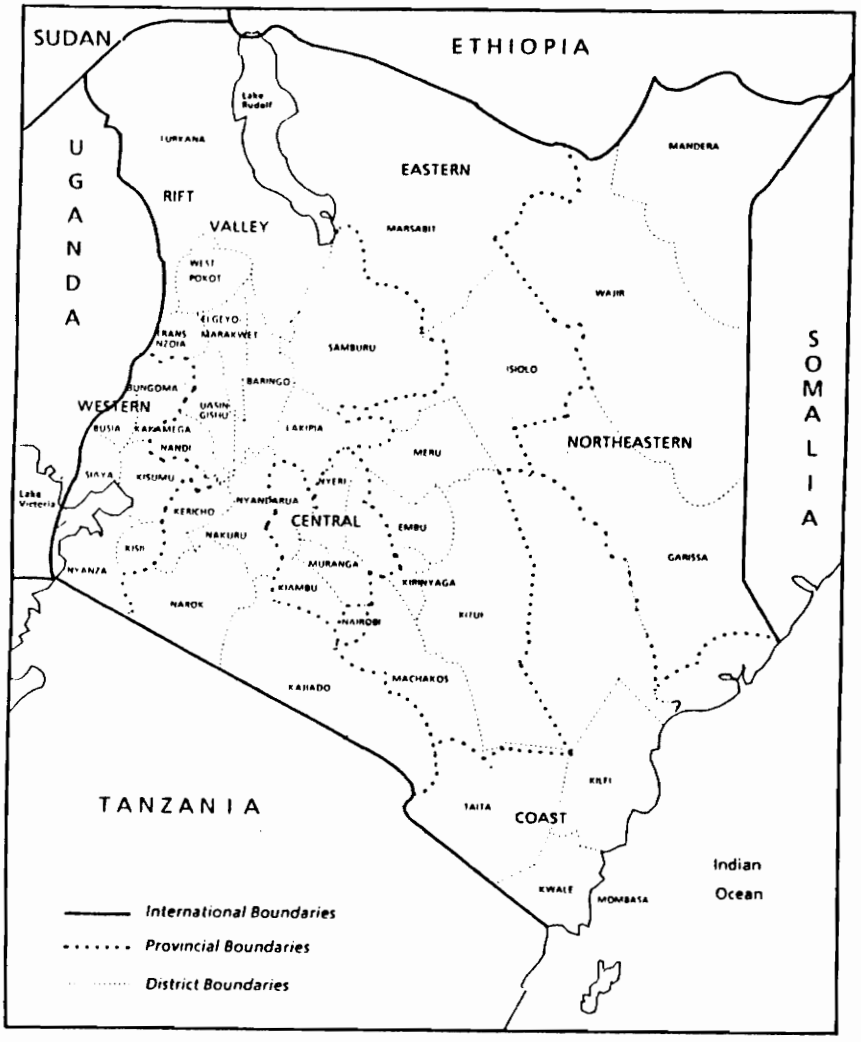
APPENDIX

Districts and Provinces of Kenya.



Source: Bates Robert H. "Beyond the Miracle of the Market: the Political Economy of Agrarian Development in Kenya." Cambridge University Press, 1989.