GAKARARA

A STUDY IN THE DEVELOPMENT OF UNDERDEVELOPMENT

THESIS SUBMITTED FOR THE
DEGREE DOCTOR OF PHILOSOPHY.
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ABSTRACT.

This thesis arises out of a microscopic examination of an agricultural community in Kenya. It examines the ecological situation in one village, Gakarara, and then attempts to discuss aspects of subsistence living within this ecological framework. The population dynamics of this underdeveloped community are examined and the urban linkages, that drain the people away from the village, emerge as critical variables in the village economy. Political and social elements of village life are discussed and the bureaucratic nature of the development administration is emphasised. An examination of landuse and farm output highlight the fact that the area is turning back from a cash crop economy into a subsistence economy. The nutritional study indicates that the community is physically vulnerable; the increasing soil erosion, through lack of labour for terracing, suggests that the community is in a situation which is rapidly deteriorating. The whole process is seen not as one of modernization but as negative development, or the development of underdevelopment.

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I need to express my thanks to many people, more especially to:

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CHAPTER ONE

THE VILLAGE SETTING

One of the simplest yet clearest descriptions of the area known as Kikuyuland in Kenya is that of Taylor (Taylor, 1969). He describes the plateau as rising from 4,000 feet in the east to over 12,000 feet in the Aberdares towards the west (Fig. 1.1); above 7,500 feet the land is forest reserve and largely uninhabited. The heavy relief-induced rainfall of the Aberdares has given rise to hundreds of small streams that have deeply dissected the volcanic rocks on the plateau into parallel ridges and valleys running west to east. The soils of the plateau are deep and fertile and rainfall totals vary from 35 inches per annum in the lower areas to over 100 inches per annum in the mountains. Over most of the plateau the mean annual temperature is between 50° and 60°F, allowing a twelve month growing season.

Gakarara, the village that is the subject of this dissertation, lies between 5,000 and 5,500 feet in classic ridge and valley country sloping eastwards from the Aberdare Mountains towards the rapidly industrialising town of Thika, just 25 miles north of Nairobi. (Fig. 1.2). The fertile volcanic soil of this area encourages intensive cultivation, particularly on the valley bottoms. Road communication is along the tops of the ridges, connecting all the small trading centres. The population is dispersed, each person having his own farm holding. For this reason, the village is more of a political and social unit than a geographical one. (Fig. 1.3). Water is obtained from the fast-flowing

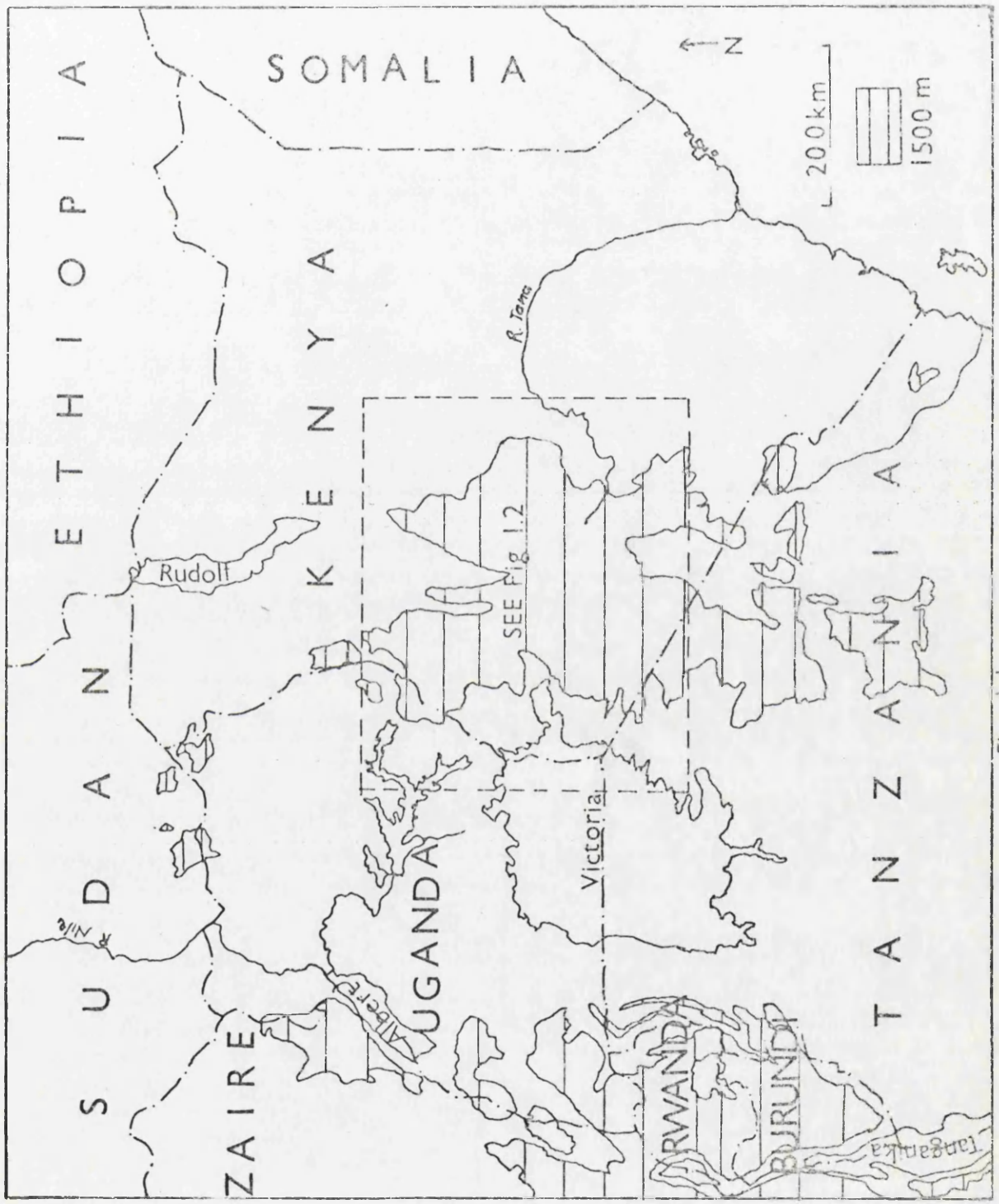

SOMALIA
ETHIOPIA
SUDAN
KENYA
UGANDA
ZAIRE
RWANDA
BURUNDI
TANZANIA
Rudolf
Victoria
Albert
Tanganyika
R. Nile
R. Tana
SEE Fig. 1.2
N
200 km
1500 m

Fig. 1.1

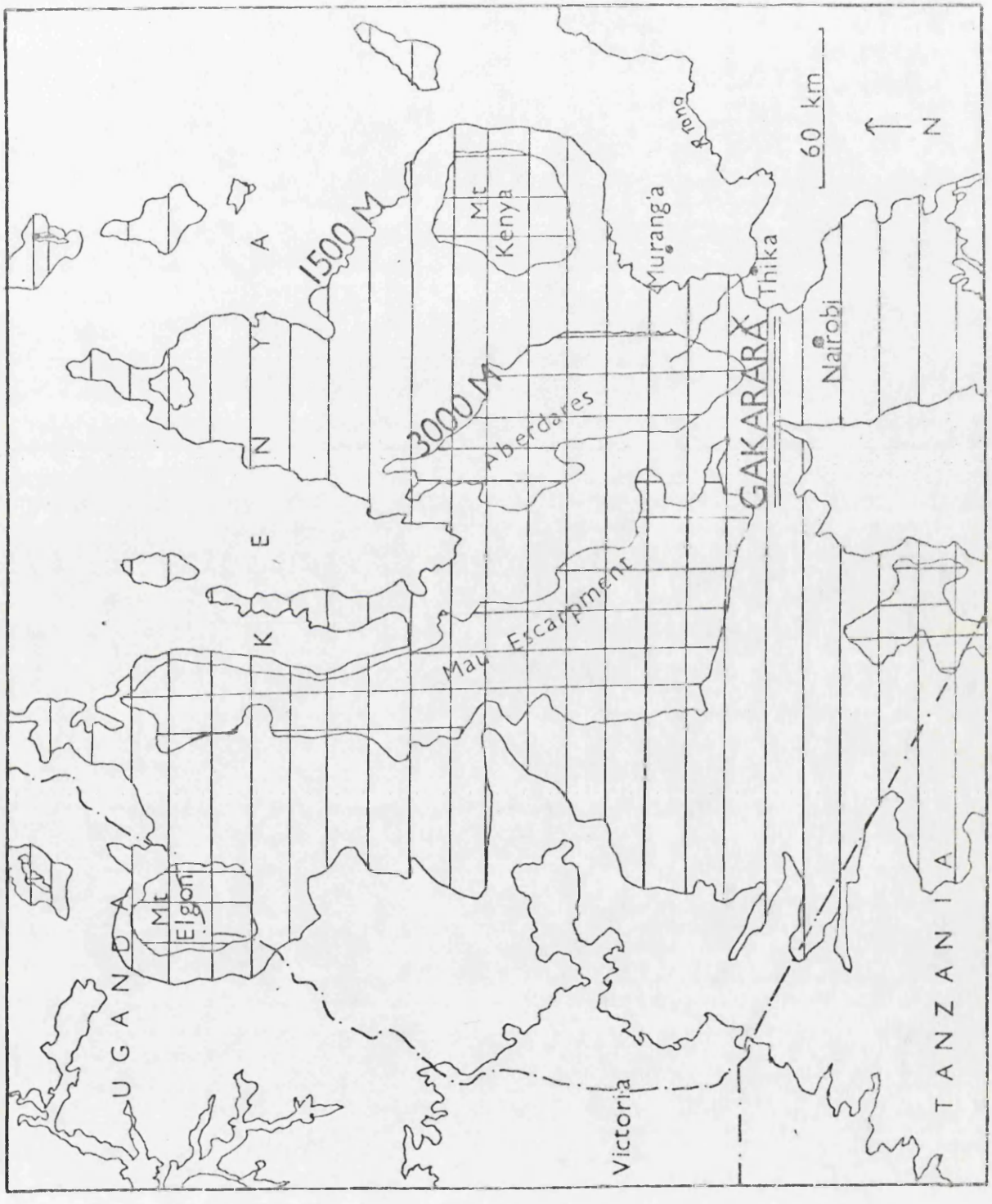
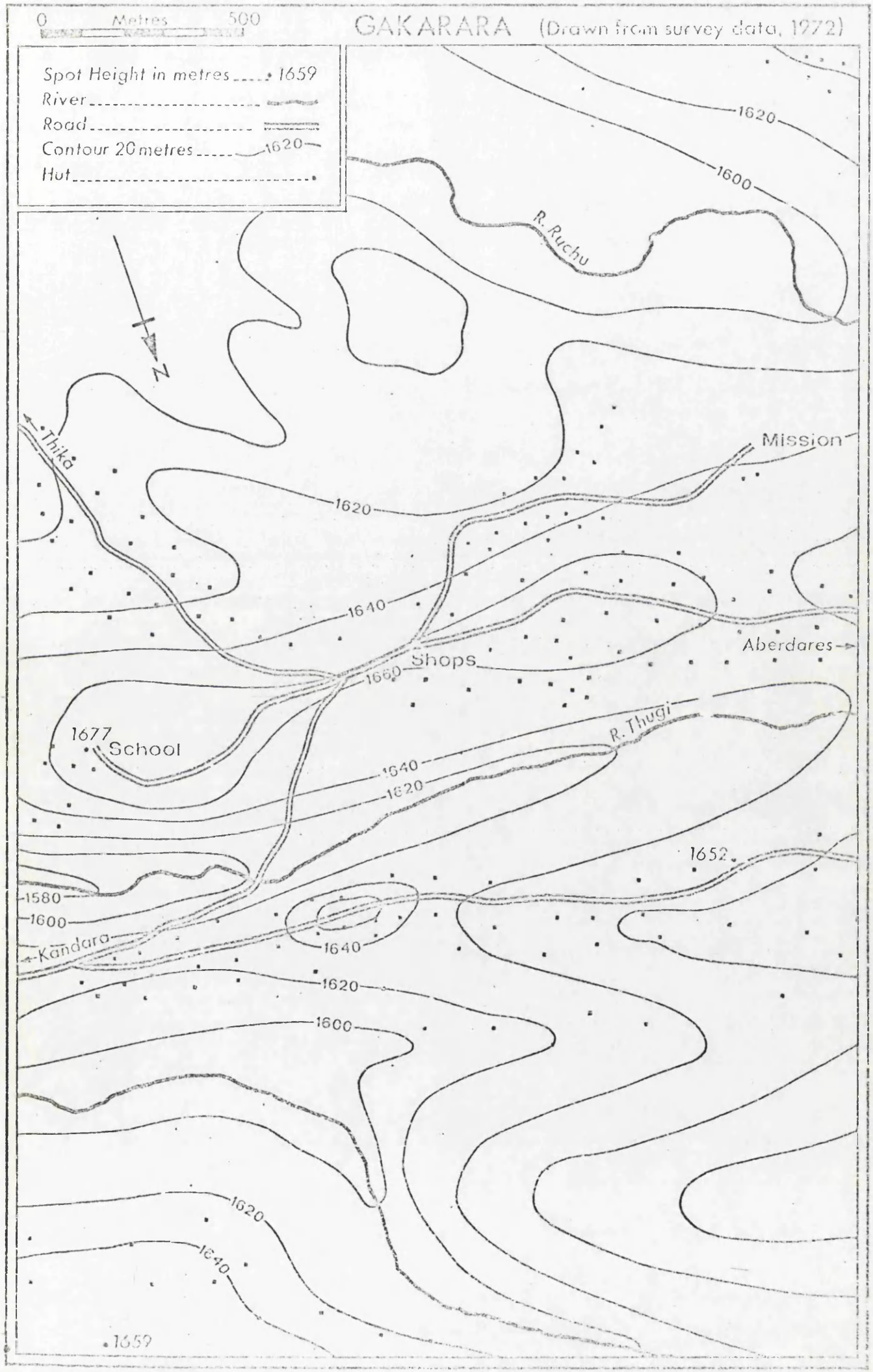

KENYA
UGANDA
TANZANIA
1500 M
3000 M
Mt Kenya
Aberdares
Mau Escarpment
Mt Elgon
Muranga
Thika
GAKARARA
Nairobi
Victoria
Athi River
60 km
N

Fig 1.2

Fig 1.3


0 Metres 500
GAKARARA (Drawn from survey data, 1972)
Spot Height in metres 1659
River
Road
Contour 20 metres 1620
Hut
N
R. Ruchu
1620
1600
Thika
Mission
1620
1640
Aberdares
1660
Shops
1677
School
R. Thugi
1640
1620
1652
1580
1600
Kandara
1640
1620
1600
1620
1640
1659

streams that run down from the slopes of the Aberdares and from a small local spring. The latter is particularly heavily used but none of these watering places enjoys any protective covering; they are therefore freely used also as water supply sites for cattle. A local health clinic and ante-natal service are available at Kandara, only one mile away. Four primary schools and one secondary school are available within the one and a half square miles that were surveyed. Housing, with two notable exceptions, is of mud and wattle formation, occasionally roofed with corrugated aluminium.

The village of Gakarara lies within Murang'a District, an area formerly known as Fort Hall. Murang'a is an area of Central Kenya approximately 1,200 square miles in extent bounded by latitudes 0° 30' south and 1°00' south and longitudes 37°00' east and 37°37' east. The actual location of Gakarara is 37°00' east of Greenwich and 0°28' south of the Equator (Map reference: BK 7701; Scale 1:250,000; Series Y503; Sheet SA-37-1; Edition 2-gsgs; Department of Survey, War Office and Air Ministry, 1963).

As already indicated, Gakarara lies in an area of permanent streams that flow from the Aberdare mountains south and west of the river Tana. The actual site is on the Tertiary and Pleistocene volcanics lying between 4,200 and 6,000 feet. These are defined as basaltic agglomerates of the simbara series (Geological Map of the Fort Hall Area. Degree sheet No. 44; South-West Quarter. Ministry of Natural Resources. The Mines and Geological Dep rtment. Kenya, 1964).

Tertiary to recent tectonic activity in the area has been slight; in recent times, the geological processes have been limited to soil formation, excavation of river valleys and the re-excavation of basement inliers. The permanent streams of the area are controlled by the dip slope of the lavas from the Aberdare Mountains.

On the whole, temperatures vary with altitude, and rainfall over the area is fairly high. The natural vegetation of the area around the village has been replaced by intensive cultivation, particularly of coffee and maize. Valley bottoms tend to be more intensively cultivated than are the higher ridge slopes. The only areas not under cultivation which are close to the village are the thickly wooded belts on the fringe of the Thika River and a little open thorn bush country on the tops of some ridges.

Wildlife in the area has been greatly reduced because of the intensive cultivation. Some small reservoirs of wildlife are found in Murang'a, e.g. the miniature "gamepark" near the Thiba River. The only wild life now seen in the village is an occasional foraging monkey.

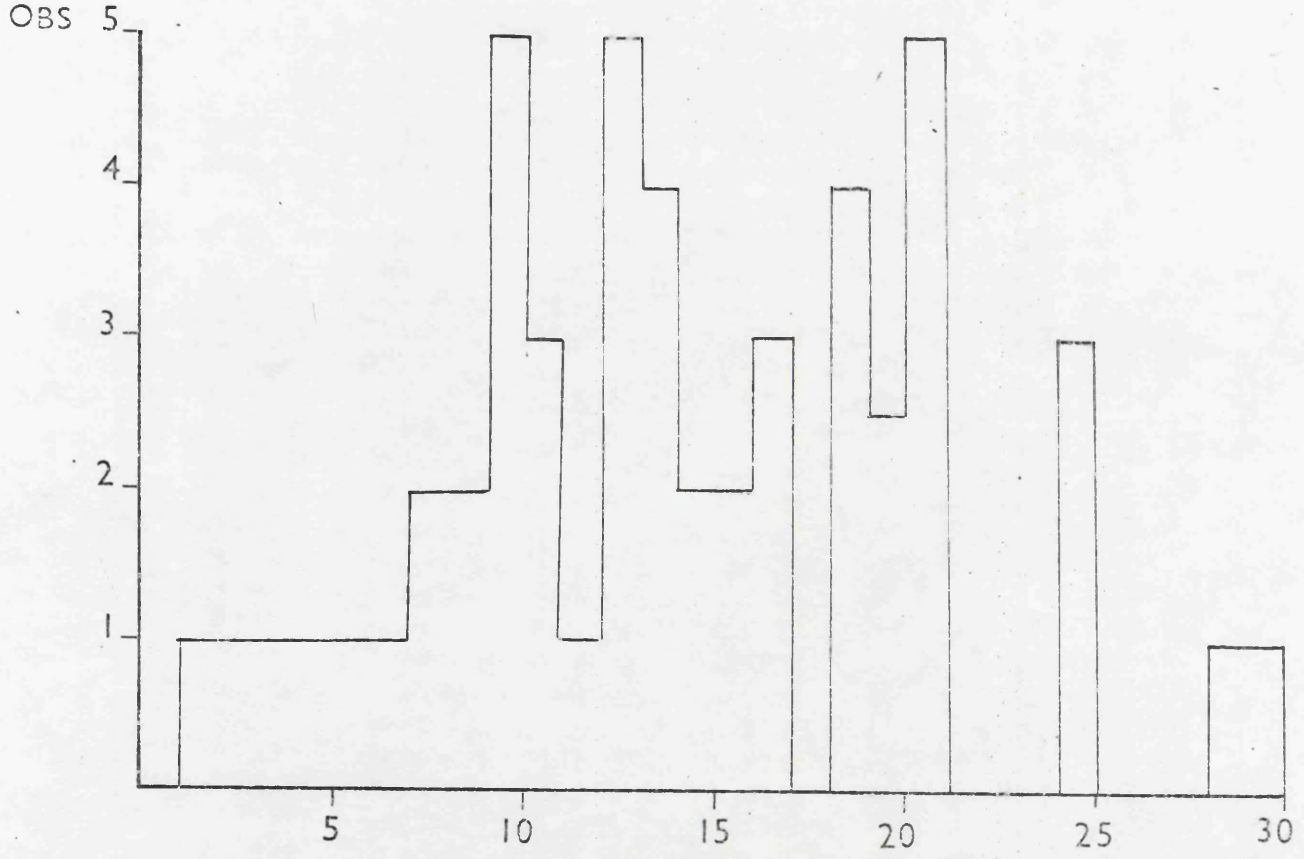
It has already been indicated that most of Murang'a District receives more than 35 inches of rainfall per annum. Relatively high precipitation is retained as ground water in the volcanic rocks and run-off is stabilised by the forest vegetation. The swift flow of the perennial streams towards the south-east provides a limited hydro-electric potential. Small permanent springs are common in this

volcanic area and are often tapped by pipe outlets through small dams. One such spring, although not perennial, is judged by the village to provide the best supply of water in Gakarara.

The village itself lies between and beyond the two valleys of the Thugi and the Ruchu. Fig 1.3 is a survey map of the village area compiled during fieldwork. The contours indicate that the slopes are rectilinear, a common feature of a young landscape moulded by fluvial processes. Fig 1.4 illustrates the distribution of the slope angles measured in the area. The sample size (fifty readings) did not allow for the differentation of slope angles between the lower, middle and upper slopes. These slopes, however, due to the nature of their geomorphic genesis, are unlikely to be differentiated in this manner. Slope angles are generally steep but the 28^{o} and 29^{o} readings indicate the existence of small bluffs. Table 1.1 contains the original slope measurements. Although the mean observations on the upper, middle and lower slopes are reasonably constant with the average around 14 degrees, there is increasing deviation of singular readings from the mean as one moves from the upper to the lower slopes. The mean values of the upper, middle and lower slopes are $13^{o}40'$, $13^{o}09'$ and $14^{o}05'$ respectively.

Besides the slope measurements, fifty soil samples were taken. The results of the analysis are contained in Table 1.2 and Table 1.3. The soil, basically weathered volcanic rock, is as deep as one metre. The usual colour reading from the Mansell Colour Chart gives a description

Fig. 1.4



SLOPE DISTRIBUTION

of a dark reddish brown soil with numerical values normally reading 5YR/ 2-3 / 3-4 for the hue, chroma and value respectively. The predominant grain size is 10 - 40 mics., indicating the small nature of the particles. The Ph. value increases slightly as one moves up the slope, providing mean readings of 5.36,5.7 and 5.8 on the lower, middle and upper slopes. The overall mean for the Ph. value is 5.6. These Ph. values demonstrate the existence of a soil that is neither too acidic nor too alkaline although there is a slight tendency towards acidity because of the nature of the bedrock. The organic and phospherous content readings also emphasise the existence of mature, fertile soil that is very suitable for agriculture. The texture of the soil, however, coupled with the steep slopes and high precipitation, make the area extremely susceptible to soil erosion; current husbandry techniques do little to prevent that erosion.

TABLE 1.1

TRANSECT A:

Point	Slope Angle	Position on Slope	Soil Colour (Mansell) Hue	Chroma	Value	
A1	5°30'	L	2.5YR	4	2	dark-reddish brown
A2	7°40'	M	2.5YR	2	4	very dusky red
A3	3°35'	U	5YR	2	3	dark-reddish brown
A4	10°50'	U	2.5YR	4	3	dark-reddish brown
A5	20°00'	M	2.5YR	4	3	dark-reddish brown
A6	13°10'	L	2.5YR	6	3	dark red
A7	16°00'	J	5YR	3	3	dark-reddish brown
A8	29°00'	M	5YR	3	3	dark-reddish brown
A9	20°00'	U	2.5YR	4	3	dark-reddish brown
A10	18°35'	U	5YR	3	3	dark-reddish brown
A11	24°50'	M	5YR	3	3	dark-reddish brown
A12	24°55'	L	5YR	3	4	reddish brown
A13	13°45'	L	5YR	2	3	dark-reddish brown
A14	19°10'	M	5YR	2	3	dark-reddish brown
A15	15°00'	U	5YR	3	3	dark-reddish brown

TABLE 1.1
(Cont.)

TRANSECT B:

Point	Slope Angle	Position on Slope	Soil Colour (Mansell) Hue	Chroma	Value	
B1	24°15'	L	7.5YR	2	4	brown/dark brown
B2	16°30'	M	5YR	3	3	dark-reddish brown
B3	19°30'	U	10YR	3	3	dusky red
B4	4°35'	U	5YR	3	3	dark-reddish brown
B5	8°10'	M	5YR	3	3	dark-reddish brown
B6	16°20'	L	2.5YR	2	3	dusky red
B7	15°30'	M	5YR	3	3	dark-reddish brown
B8	14°30'	M	2.5YR	4	3	dark-reddish brown
B9	9°10'	L	2.5YR	2	3	dusky red
B10	6°20'	M	5YR	3	3	dark-reddish brown
B11	12°20'	U	5YR	3	3	dark-reddish brown
B12	10°00'	U	2.5YR	4	3	dark-reddish brown
B13	9°05'	M	5YR	4	3	dark-reddish brown
B14	9°10'	L	5YR	3	3	dark-reddish brown
B15	12°35'	L	5YR	3	3	dark-reddish brown
B16	9°05'	M	5YR	3	3	dark-reddish brown
B17	12°15'	U	2.5YR	4	3	dark-reddish brown
B18	12°35'	U	5YR	3	4	reddish brown
B19	8°10'	M	5YR	4	3	dark-reddish brown
B20	11°45'	L	5YR	3	3	dark-reddish brown
B21	18°10'	L	5YR	3	3	dark-reddish brown
B22	18°10'	M	5YR	3	3	dark-reddish brown
B23	10°50'	U	2.5YR	4	3	dark-reddish brown

TABLE 1.1
(Cont.)

TRANSECT C:

C1	12°35'	U	5YR	2	3	dark-reddish brown	maize
C2	12°55'	M	5YR	2	3	dark-reddish brown	bananas, maize, cabbage.
C3	2°25'	L	2.5YR	2	3	dusky red	bananas, maize, beans, cassava.
C4	20°55'	L	2.5YR	2	3	dusky red	
C5	18°10'	M	5YR	3	3	dark-reddish brown	maize, beans.
C6	13°00'	U	5YR	3	3	dark-reddish brown	grass(sample).
C7	14°05'	U	2.5YR	4	3	dark-reddish brown	coffee, esparto.
C8	20°00'	M	2.5YR	4	3	dark-reddish brown	coffee, bluegum, wattle.
C9	28°35'	L	2.5YR	4	2	dark-reddish brown	wattle.
C10	9°05'	L	2.5YR	4	3	dark-reddish brown	cassava.
C11	7°45'	M	2.5YR	2	3	dusky red	maize, beans.
C12	20°00'	U	10YR	3	3	dusky red	ferns, wattle, etc.

TABLE 1.2

KANDARA SOIL SAMPLES

ph, % organic content, phosphorous testing:

(L - Lower Slope, M - Middle Slope, U - Upper Slope)

L	Sample No.	L	pH	% Organic	phosphorous
L	A1	5°30'	5.15		
M	A2	7°40'	6.40		
U	A3	3°35'	6.35	4.18	0.105
U	A4	10°50'	5.65		
M	A5	20°00'	4.55	3.66	0.095
L	A6	13°10'	5.25		
L	A7	16°00'	6.25		
M	A8	29°00'	4.85		
U	A9	20°00'	4.65		
U	A10	18°35'	4.60		
M	A11	24°50'	4.60		
L	A12	24°55'	5.40		
L	A13	13°45'	6.10	5.40	0.220
M	A14	19°10'	6.00		
U	A15	15°00'	5.50	5.50	0.130
L	B1	24°15'	6.95		
M	B2	16°15'	6.40		
U	B3	19°30'	5.45		
U	B4	4°35'	6.80		
M	B5	8°10'	6.50		
L	B6	16°20'	6.30		
L	B7	15°30'	6.30		
L	B8	14°30'	5.15		
L	B9	9°10'	5.50		

TABLE 1.2 Cont.

	Sample No.	L	ph	% Organic	phosphorous
M	B10	6°20'	5.60		
U	B11	12°20'	6.40		
L v U	B12	10°00'	4.45	5.35	0.275
H v M	B13	9°05'	5.80	8.66	0.185
H v L	B14	9°10'	5.45		
L	B15	12°35'	5.35	5.16	0.195
M	B16	9°05'	5.90		
U	B17	12°15'	6.45		
U	B18	13°55'	4.70		
M	B19	8°10'	5.90		
L	B20	11°45'	5.70		
L	B21	18°10'	5.50		
M	B22	18°10'	5.65		
U	B23	10°50'	4.90		
U	C1	12°35'	7.05		
M	C2	12°55'	6.60		
L	C3	2°25'	6.25		
L	C4	20°55'	6.30		
M	C5	18°10'	6.85		
U	C6	13°00'	5.30		
U	C7	14°05'	4.50	5.66	0.165
M	C8	20°00'	4.70		
L	C9	28°35'	4.70	4.66	0.170
L	C10	9°05'	4.70	7.00	0.135
M	C11	7°45'	5.60		
U	C12	20°00'	4.75		

TABLE 1.3

SELECTED KANDARA SOIL SAMPLES

			Weight	%
SITE A3	GRAIN SIZE	-160 mic.	9.82	18.29
		100-160	5.75	10.71
		40-100	14.52	27.03
		10-40	18.43	34.32
		-10 mic.	5.18	9.65
	Colour	Hue 5YR	Value 3	Chroma 2
		Colour Dark-reddish brown		
SITE A5	GRAIN SIZE	-160 mic.	5.27	13.50
		100-160	2.56	6.56
		40-100	8.61	22.05
		10-40	16.28	41.69
		-10 mic.	6.33	16.20
	Colour	Hue 2.5YR	Value 3	Chroma 4
		Colour Dark-reddish brown		
SITE A13	GRAIN SIZE	-160 mic	3.48	7.84
		100-160	1.50	3.38
		40-100	5.69	12.82
		10-40	23.80	53.87
		-10 mic	9.89	22.09
	Colour	Hue 5YR	Value 3	Chroma 2
		Colour Dark-reddish brown		

			Weight	%
SITE A15				
	GRAIN SIZE	-160 mic	6.28	14.39
		100-160	3.89	8.82
		40-100	11.37	26.06
		10-40	16.47	37.75
		-10 mic	5.66	12.98
	Colour	Hue 5YR	Value 3	Chroma 3
		Colour Dark-reddish brown		
SITE B12				
	GRAIN SIZE	-160 mic	4.50	10.45
		100-160	2.60	6.04
		40-100	7.48	17.38
		10-40	16.79	38.95
		-10 mic	11.68	27.18
	Colour	Hue 2.5YR	Value 3	Chroma 4
		Colour Dark-reddish brown		
SITE B13				
	GRAIN SIZE	-160 mic	5.32	13.53
		100-160	3.04	7.73
		40-100	8.18	20.81
		10-40	15.89	40.44
		-10	6.86	17.49
	Colour	Hue 5YR	Value 3	Chroma 4
		Colour Dark-reddish brown		
SITE B15				
	GRAIN SIZE	-160 mic	5.38	13.55
		100-160	3.17	8.75
		40-100	9.68	24.33
		10-40	13.76	8.75
		-10 mic.	7.44	18.74
	Colour	Hue 5YR	Value 3	Chroma 3

			Weight	%
SITE C7				
	GRAIN SIZE	-160 mic.	6.11	14.88
		100-160	3.64	8.86
		40-100	9.95	24.23
		10-40	15.88	38.67
		-10 mic.	5.48	13.36
	Colour	Hue 2.5YR	Value 3	Chroma 4
		Colour Dark-reddish brown		
SITE C9				
	GRAIN SIZE	-160 mic.	4.11	11.30
		100-160	2.39	6.51
		40-100	6.94	19.63
		10-40	14.49	39.87
		-10 mic	8.43	22.69
	Colour	Hue 2.5YR	Value 2	Chroma 4
		Colour Dark-reddish brown		
SITE C10				
	GRAIN SIZE	-160 mic.	4.89	11.87
		100-160	2.87	6.96
		40-100	9.39	22.80
		10-40	14.70	35.69
		-10 mic	9.33	22.68
	Colour	Hue 2.5YR	Value 3	Chroma 4
		Colour Dark-reddish brown		

This very brief description of the physical milieu of the village does at least indicate that the area is potentially highly productive. The analysis which follows will attempt to discuss why this high production is not achieved. To enable the reader to follow the argument in a clearer fashion, however, it is perhaps worthwhile to draw a pen picture of the journey from Nairobi to the village of Gakarara.

One leaves Nairobi by way of the Westlands, a largely European suburb containing large detached houses and extensive gardens. The road is a two-lane highway to the industrial town of Thika. Along the road are several factories, frequently owned by multi-national corporations. At Thika, one leaves the tarmac surface and turns towards the Aberdares along a murram track. The first mile contains the local golf course and the new housing estate for executives employed in the local factories. During the next four miles one passes through an area of coffee plantations and associated workers' dwellings; all the plantations are still owned by the European settlers. Next come the individual holdings of small-scale peasant producers growing coffee for the local cooperatives; the fields contain few subsistence food crops. A further twelve miles along the track one arrives at Gakarara, which is clearly not a nucleated village, there being evident only a collection of shops on the side of the track. During the Mau-Mau Emergency the village was grouped together on the highest point in the area; but after Independence the villagers returned to their individual

plots of land. No house in the area is over ten years old. The local population, however, identifies the settlement as Gakarara and, to save confusion, this term will be used throughout this work. It must be emphasised, however, that the Swahili word for village, Kijiji, does not necessarily imply a concentration of households but rather a social meeting place.

Ecologically, Gakarara is too low for good tea production and too high for good coffee production, the two major cash crops for Kikuyuland. Consequently, the men of the area increasingly leave to search for urban employment and the women increasingly seek part-time employment on the nearby coffee estates; the holdings within the village have therefore been deteriorating to purely subsistence holdings and soil erosion is being passively encouraged. The road from which one travels out of Gakarara is, in this sense, the road to Damnation. It leads the rural population out into an urban economy, drains the resources of the rural areas and accelerates the death of the African countryside. This process is the focus of the present thesis.

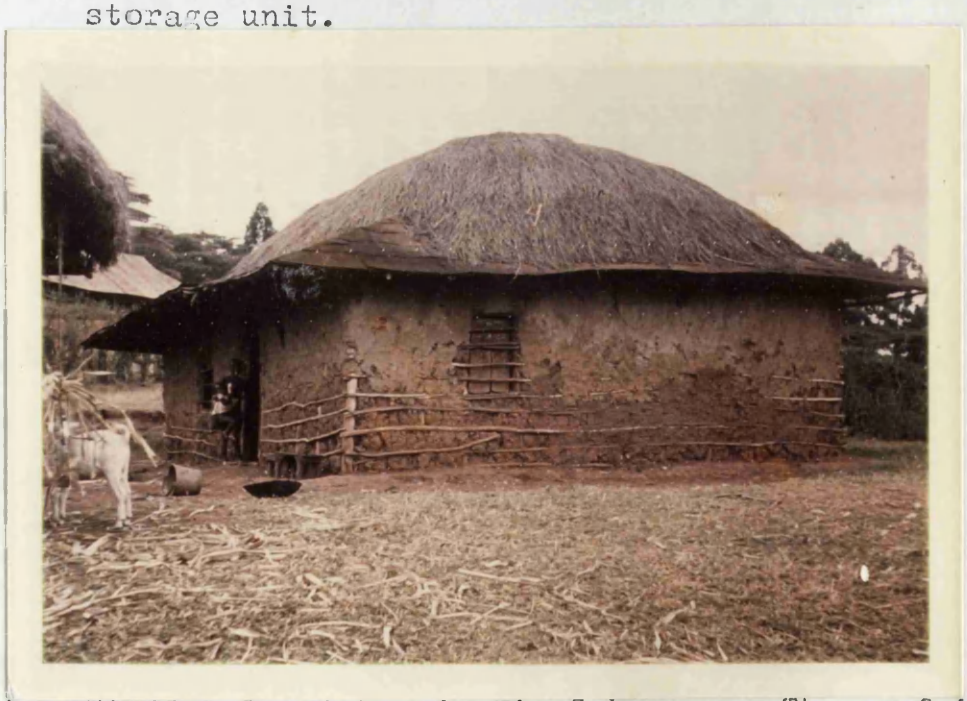
1. The end of the Road to Damnation. Detached houses in Thika belonging to local industrialists.

2. Passing the coffee plantations. Note that crop production ends at the break of the slope.

3. Housing for the plantation employees. No permanent employee has rights to cultivate a personal holding on the estate.

4. Coffee small-holdings along the Road to Damnation. Note the differentiated landuse; wattle on the steep slopes, coffee on the middle level and subsistence crops in the valley bottom.

5. Local housing in Gakarara. Note the sparse vegetation that surrounds the house, the chicken coop and water storage unit.



6. Similar local housing in Gakarara. The roof is covered with both old tin and grass; the mud and wattle construction is clearly shown.

7. The local quarry indicates the depth of the volcanic deposits. A layer of agglomerates occurs before the layers of more recent tectonic activity. Above the quarry face is the dense wattle vegetation.

8. Upper slopes of Thugi Valley Maize and banana cultivation with lapia grass and wattle in the background.

9. Crest of slope in the Ruchu Valley. Largely uncultivated secondary vegetation occurs in this area.

CHAPTER TWO

POPULATION RESIDENT IN GAKARARA

In a predominantly subsistence economy, primary production of food is likely to be the dominant characteristic and the community rurally orientated. Kenya is in such a situation where the rural areas comprise over 98 per cent of the land and, more importantly, contain more than 90 per cent of the people. Population densities are locally very high. Morgan and Schaffer (1966) state that 85 per cent of the population in Kenya reside in areas that have an overall density greater than 39 persons per square mile but this is a misleading indicator of population density because economic and ecological opportunities are not uniform. Odingo (1971) makes a more pertinent observation when he notes that, in reality, potentially productive areas are limited to one third of the country. Thus, even at the macroscale, there is an indication that the population densities of Kenya vary enormously.

Surveys that concentrate on macroscopic units tend to create a faceless and often false impression of uniformity. Thus, the E.C.A. report on the demographic situation in East Africa states:

> "There does not seem to be much population pressure in Africa" (1965).

As Hance (1970) so clearly indicates, however, it is of paramount importance to distinguish between the concepts

of density and distribution even though the two concepts are necessarily interrelated. Density focuses on area and distribution on points; and it is important to determine whether the metaphor, population pressure, refers to area or points. Density itself only takes on meaning in relation to the economic and ecological environments it describes. Wisner and Mbithi reached this conclusion in their studies of population adjustment to drought conditions in Kenya when they stated that,

> "Individuals and potentially small groups of individuals in the driest areas are aware of highly localised resource potential." (1972.5)

Population pressure is discernible when the existing land use and technology, at time 't' in the development process, is unable to support the population. Pressure reflects the estimated carrying capacity of the land. Several attemps have been made to assess the critical carrying capacity of the land but this has largely centred on the quantification of edaphic factors (Porter 1967). People, though, do not eat land; the problems of population pressure are as much related to social and political influence as they are to the environmental conditions or even population numbers per se.

The carrying capacity of the land may be defined at two different levels, namely, the economic and the absolute. Diminishing returns are experienced when the economic carrying capacity of the land is exceeded but, in this instance, a community often discovers alternative sources of income or life support. The absolute carrying capacity of the land is attained when a community incurs

Malthusian checks because no alternative source of food or income is available. Such a concept implies a certain critical level of stress, a threshold value, within a food production system. Boserup's reorganisation of the Malthusian principal so that population growth is recognised as the independent variable, which is a major factor in determining changes in agricultural productivity, essentially utilises this concept (Boserup 1965). Man-land relationships are complex and not merely a question of numbers and areas. At the expense of labouring the point, it must be stressed that various social factors and elements such as the degree of technical skill, customs and decision-making processes, interfere with any attempts at simplistic quantification in the same way that varying geographical, geomorphological, climatic and edaphic conditions make ecological projections difficult.

Despite this pessimism, it is possible to determine six alternatives which are available to a spatially finite community experiencing population pressure (Eyre 1971). The first is to increase the productivity from the existing utilised land. Basically, this depends on increasing either the labour input or the technological resources. Eyre argues that three stages are experienced if this alternative is pursued and the population increase is unabated,

> "When land is abundant, minimization of energy-cost is the norm and, because of the limited interaction over distance, surpluses must be consumed rapidly... As the population increases, a hierachy of utilization choices based on the minimization of input is replaced by one based on the maximization of energy expended... As the pressure continues unabated, maximization of energy-value product per unit area becomes paramount despite any additional inputs required." (Eyre 1971, 70)

This alternative is the framework within which agricultural extension officers employ their energies and is usually the alternative favoured by government.

The second alternative is the occupation of unutilised land. Such an example of spontaneous settlement was discussed by Wisner in his report on the Rendille settlement scheme at Songa, Marsibit (Wisner 1972). The community had previously availed themselves of famine relief at Logologo and considered this settlement as an alternative to the famine relief. A political variation of this alternative was suggested in the Kenyan Development Plan where it was envisaged that around 33,000 families could be settled on squatter settlements during the Plan period, which is about the same number settled under the Million Acre Scheme (Smith 1969). Despite the problems inherent in both these examples of the occupation of "unutilised" land, there has been a considerable shift in the population distribution because the land frontier is still open. The implications of this situation were strongly emphasised by Leys when he suggested that as long as the land frontier is still open the work force will be primarily rural based and rural orientated (Leys 1972).

The third alternative is the development of external linkages to provide secondary sources of income. This tactic is most favoured in developing countries in a stage of transition from a subsistence economy. Thus, Mbithi and Wisner found that one of the most favoured responses to drought in Eastern Kenya was short-term

migration to the nearest upland area in search for wage employment (Mbithi and Wisner 1972). This research will demonstrate that population pressure is so great in the Kandara area that permanent or long-term migration is the order of the day.

The fourth and fifth alternatives, emigration and the control of fertility respectively, have little direct bearing on the areas of population pressure at the present moment. The former can be classified as a 19th century phenomenon, whilst the latter, which requires the formulation, establishment and utilization of family planning services, leaves much to be desired. The sixth and final alternative occurs when the absolute carrying capacity of the land is exceeded and there is no other source of income. There is a decline in the standard of living and a rise in the morbidity and mortality rates; such a situation presently exists in the broad Sahelian belt lying immediately to the south of the Sahara.

The options available to the community depend upon the cultural and enviromental milieu in which it is situated. One of the six alternatives or permutations of them must be adopted. It will be argued that the population problems that face the village of Gakarara are best demonstrated in the attitude towards urban migration; it is further suggested that all aspects of migration are but facets of the choice that the community has been forced to make - the choice to build up external linkages.

Various projections exist about the growth of Kenya's population. Morgan and Schaffer suggest a conservative 2.5 per cent to 3 per cent per annum (Morgan and Schaffer 1966). Ominde is more liberal and suggests 3 per cent, whilst the present Five-Year Plan assumes that population growth is in excess of 3 per cent (Ominde 1968: 5yr, 1970). The local M.P. for Gakarara believes that the population increase is above 3.5 per cent per annum but has no data to support his case. Whatever the figure, however, rapid population growth does exist and thus exacerbates problems of population pressure in this and similar areas of Central Province.

Central Province has only the fourth highest population density of the eight Kenyan provinces. Murang'a, one of its districts, has a population almost approximating that of Kiambu which is the closest farming area to Nairobi; the respective figures are 450 and 455 per square mile. One of the chief problem areas, Kandara, is located in Murang'a district.

The problems of Central Province are acute even when they are viewed on the macroscale. For example, 31.6 per cent of all the interprovincial migrants come from Central Province and the migrants' tribal base is predominantly Kikuyu (Ominde, 1970) but there is a substantial return migration of men over the age of 44 years returning to farm their holdings (Ominde, 1969). Several alternative hypotheses have been offered to explain the Kikuyu move towards modernity. Soja suggests

that the reason is the proximity of the Kikuyu settlement to the areas of development - the Highlands and Nairobi (Soja, 1968). Rosberg and Nottingham emphasise the degree of individualism and the achievement orientation of traditional Kikuyu society (Rosberg and Nottingham, 1966). Without attempting to be dogmatic or deterministic, it would seem that population pressure and consequent economic stress are the more critical factors in the modernization process and that the other two influences merely encourage the rate of change.

The first population count of Murang'a was made in 1903 when 27,000 huts were recorded in the district (Taylor 1966). This figure, multiplied by five, produced an estimate of 135,000 persons, suggesting a density of 240 persons per square mile. The next available figures for the district are tabulated in Table 2.1. The total population, according to this census, is lower than that of the earlier one. There are several possible reasons why this total should appear lower than the 1903 estimate. First, the multiplication of the numbered huts by the factor five considerably exaggerates the total population of the area if one considers the utilization of traditional homesteads (Osogo, 1968). Secondly, the food shortages and the epidemic of the 1918-19 period reduced the population. Thirdly, Taylor points to the reluctance of the Kikuyu to enumerate their children as it was considered unlucky and includes other estimates as a correction factor. These are given in brackets in Table 2.1 (Taylor, 1966).

By 1940, the population was given as 200,000 (352 per square mile) and the census of 1948 recorded 303, 854 (535 per square mile). The 1962 census calculated the total population as 344, 854 (491 per square mile) and these figures are considered more accurate than the 1948 enumeration. What is important to note is that this indicates an annual popululation increase over the 50 years of 2.66 per cent. The 1969 census results are detailed below (Table 2.2). Boundary changes of the enumeration areas in 1964 created a statistical hiatus and precluded comparison with the 1962 figures.

The figures illustrate the classic population dynamics experienced in most developing countries. The proportion of the population under sixteen years of age, who by this census were classified as children, is a disproportionate section of the community and, again, the female adults outnumber the male adults in this predominantly rural area. If one examines the Murang'a population figures microscopically then one gains the impression that the average density figures camouflage reality; population density varies enormously. Table 2.3 demonstrates that, if one descends the administrative hierarchy from the level of the district to the sub-location in which Gakarara itself is located, the population pressure increases accordingly.

TABLE 2.1

FORT HALL POPULATION COUNT. 1924.

Men	50,250	
Women	44,453	
Children	35,053	(55,619)
Total	129,728	(150,322)

TABLE 2.2

Murang'a Population Census. 1969.

(Murang'a is the preferred name for Fort Hall)

Total Male	208,947
Male Children	119,541
Male Adults	89,406
Total Female	236,363
Female Children	117,011
Female Adults	119,352
TOTAL POPULATION	445,310
DENSITY (SQ. ML.)	450 (27)

TABLE 2.3

Population Density

AREA	DENSITY (SQ. ML.)
Murang'a District	450
Kandara Division	773
Muruka Location	978

Detailed field surveys were carried out in Gakarara village from May 1972 until August 1972 on 300 spatially contiguous holdings or shambas. When each of the households, which are the basic unit of socio-economic organisation, ~~and~~ centred round the male head and his family and ~~which are~~ taken to be synonymous with the land holdings, replied to the questionnaire, it was revealed that the total number of the people that were supposed to be in the village was 2,412 persons. This meant an average of more than 8 persons per household. As the area surveyed is little over 1.5 square miles, it is obvious that this figure greatly exceeds that of the census (Table 2.3). When the actual number of people living on the 300 holdings was systematically recorded, however, the total was shown to be 1,522 persons, giving a mean population per household of five persons. The second, correct, total is only 63.1 per cent of the population that the villagers claim lives in that settlement. Although this discrepancy could be explained in terms of the difficulties involved in data collection, as in all developing countries, and of the unwillingness of the community to respond to questionnaires, the explanation would still be incomplete. The explanation should rather be sought in an understanding of the nature of the extended family and the obligations therein.

The size of family varies enormously. Respondents who claim that they live only by themselves, 14.6 per cent of the total population, are a group consisting largely of single school teachers who teach in the area or of

MEDIAN AND INTERQUARTILE RANGE

OF FAMILY SIZE

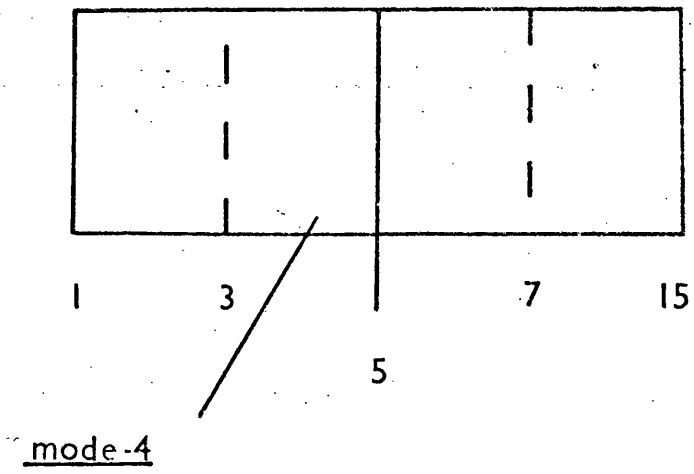


FIG 2.1

Ministry of Work employees who are billeted there. With such an irregular distribution, the average family size is a meaningless concept. Fig 2.1 demonstrates this range and the inter-quartile range; the median of the distribution is the division containing five members in each family; and the other measure of the central tendency, the mode, is the division with four members to each family. Less than 10 per cent of the families have ten or more children and there is only one example of a family of 15 persons, the largest family in the village.

If one studies Table 2.4 closely, a table which demonstrates the age range of the households heads, then one appreciates the expected proportion of household heads that occurs between the age range of 20 to 60 years; the mode of the distribution lies between the ages of 30 to 39. Several points bear comment at this juncture. First, it is noticeable that very few people beneath the age of twenty years are household heads, even though several are married. Because of the identification of the household and, consequently, the household head with the land holding, few young men would register themselves as heads of households. If their fathers were still alive then they would regard him as head of the household because he possesses the title deeds for the holding. Secondly, the group of household heads over the age of 80 years is predominantly a group of women who are widowed. With the re-registration of land in the past fifteen years, they have received the title deeds

in their name because their husbands died shortly after the time of land survey. Lastly, even though the 30 to 39 age group contains the highest proportion of household heads, their influence upon the village affairs is slight; most of them are working as migrant labourers in the towns and so have only a tenuous grasp of the village political issues.

One of the better methods of simply indicating the distribution of the population according to age and sex is to utilise that time-honoured histogram beloved of geographers - the age-sex pyramid (Fig. 2.2).

TABLE 2.4

Age Range of Household Heads

Age in Years	No. of Household Heads	Percentage
10-19	1	0.3
20-29	58	19.3
30-39	67	22.3
40-49	44	14.6
50-59	48	16.0
60-69	45	15.0
70-79	26	8.6
80-89	6	2.0
90-99	5	1.6

(n = 300)

TABLE 2.5

Location of Birth of the Population

Place	Number	Percentage
Within Sublocation	1,326	87.1
Within Location	62	4.1
Within Division	55	3.6
Within District	71	4.7
Within Province	6	0.4
Other	2	0.1

(n = 1,522)

AGE / SEX OF RESIDENTS

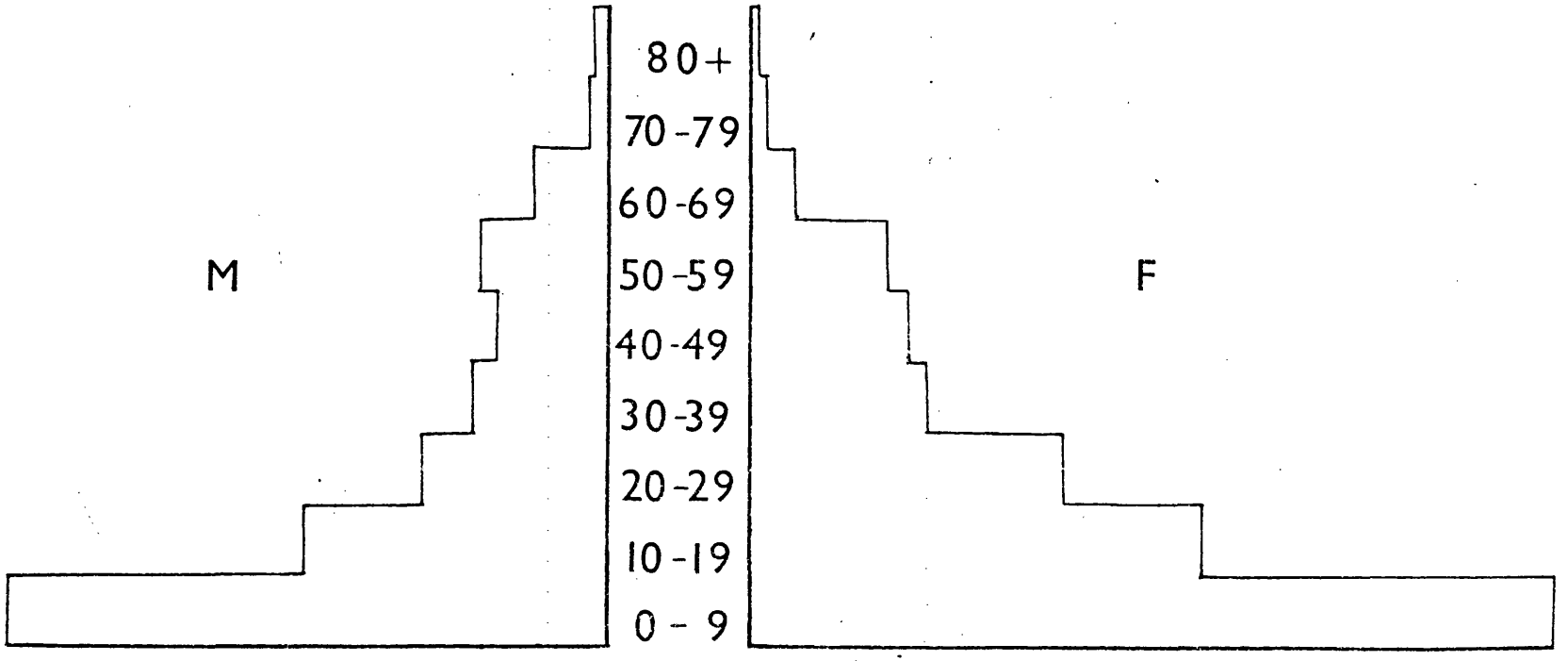


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FIG 2.2

Again, the histogram demonstrates several interesting facts. First, over 25 per cent of the population is under nine years of age and over 58 per cent of the population is under nineteen years of age. This situation indicates the extent to which the existence of the population is jeopardised; the grave age imbalance, the dependence of this substantial proportion on parental income, the inability to secure permanent employment, all combine to produce a situation in which it becomes imperative that the head of the household should take permanent wage labour away from home. Only three of the males and none of the females in this age group has any wage employment. This contrasts sharply with the older group of males, between the ages of 20 and 59. In no division do the males of the resident population exceed the numbers of females in the age group 20-59. The evidence that heavy outward migration of the male wage earners occurs is the second and, perhaps, most important point. Thirdly, the claims of the few people who regard themselves as being over the age of eighty years should be treated with caution; people are not implying that this is the exact extent of that man's or woman's lifespan but, rather, they are indicating respect for that particular person because of his age and experience. Unlike a population pyramid that stresses the population dynamics of a nation state, this histogram sensitively reproduces the influences and effect of population pressure experienced at village level. Another version of this distribution (O'Keefe, 1972) reveals that there is a lower number of children in the 0-4 age group than in the 5-9

age group; this a probable result of the establishment of the family planning clinic at Kandara five years ago. The bulge that is observable around the 10-14 age group is attributed to the number of school children coming to reside in the area so that they may attend Gakarara secondary school. Males between the ages of 15 and 24 have begun to search for employment outside the Gakarara subsistence complex but, most frequently, they do not find such employment and so are continually floating between the village and the urban areas. This observation is not true of that age group between 25 and 59 which has already tended to build up the external linkages of wage employment and to stabilise them as consistent sources of income; this is not particularly suprising because it is this section of the population that has to support the dependents in the village. Between the ages of 35 to 44, several men return to the village to work the family holdings, but only if their parents are too infirm to perform the task. Above this age group, the males tend to continue work outside the area until the age of sixty; they then return to the shamba to die in the security of their land and extended family system. The only inexplicable frequency in the female age groupings is the relative decrease within the 20-39 age group. As most women do not go to live at their husbands' source of employment, other explanations must be found. Two tentative ones can be advanced to throw some light on the situation, namely, that there was a high death rate in childbirth before the opening of the maternity clinic and, secondly, that there was an outward migration of women

who had been married during the Emergency and who left to settle on the new schemes in the Rift Valley.

Like any community, the village has its share of widowers and widows, five and nine respectively. There are five men with two wives; the youngest of these husbands is thirty five. The custom of polygamy, however, appears to be dying out. Only three couples in the village are childless. Another interesting aspect of these marital relationships is that there was only one example of a woman who was older than her husband; in this case, she had married her former husband's younger brother. Generally, however, the male is at least five years older than his wife.

Table 2.5 indicates the location of birth of the residents of Gakarara. One of the difficulties of attempting to assess the location of birth is that most people identify not with the place of their birth but with the name of the chief of the area in which they were born. As a result, there is a general non-identification of the sub-location, which is the jurisdiction of the subchief, but an identification of the location. However, wishing to emphasise that they were born in the immediate locality, they specify the sub-location as their place of birth. Although these first two divisions might therefore be disproportionate between themselves, they do stress the general tendency that people are now living very close to the area in which they were born; this displays a

certain caritas humi. The figures for the district level are distorted by the presence of the external workers although it is interesting to note that most of them come from the immediate hinterland of Kandara. Except for the migrant labour, either into or from Gakarara, the population has been resident in the village for the major proportion of its life. Only 32 first-born children were born outside of the village; only 7 second-born were born outside. These 39 children comprise 22 per cent of the population that were not born in the village. The other residents who were not born in the village are the teachers and the Ministry of Work employees or the women who married into this particular community. This last group is important for it emphasises the patrilineal system of the Kikuyu; as wives, they have moved on to their father-inlaw's holding.

The educational status of the community is an important consideration because it indicates, to a certain extent, the suitability of the community for outside employment. Plotted against age, educational status allows some index of modernisation to be produced. There has been a secondary school in this village since 1922 and some evidence would suggest that it was the first African school in Kenya. One should therefore be able to presume a generally high standard of education, but this is not the case. Table 2.6 is a general representation of the educational status of the resident population. More than 50 per cent of the population over the age of twenty has received no formal education whatsoever; this

percentage is not indicative of the general situation throughout Kenya where far less people have received a formal education (Wisner, 1971), but it is remarkably low considering the proximity of the school to the village and the period of time during which it has been open. 50 per cent of the male population has received a formal education of two or more years but more than 50 per cent of the women have had no formal education. In particular one should notice the time extension of male education to twelve years. The cut-off points in the educational system seem to come at the second, fourth, sixth, seventh, eighth and tenth years; but at these junctures more women than men seem to abandon the educational system.

The series of graphs which detail the educational status of the population by age and sex confirm what was indicated in Table 2.6 (cf Fig. 2.3). The women of the village suffer from the lack of educational opportunity when their education status is compared with that of the men. For example, only four men under the age of thirty have received no formal education; but fifty-two female contemporaries have received no formal education. In the same age group, thirty two men proceeded to a form of higher education whereas only seven women reached the same level; this figure for the male educational status is somewhat biased by the presence of the teachers in the village but the general conclusion remains valid. Perhaps the most disconcerting evidence offered by the graphs is that it is only the youngest age group which has any pre-eminence in the educational

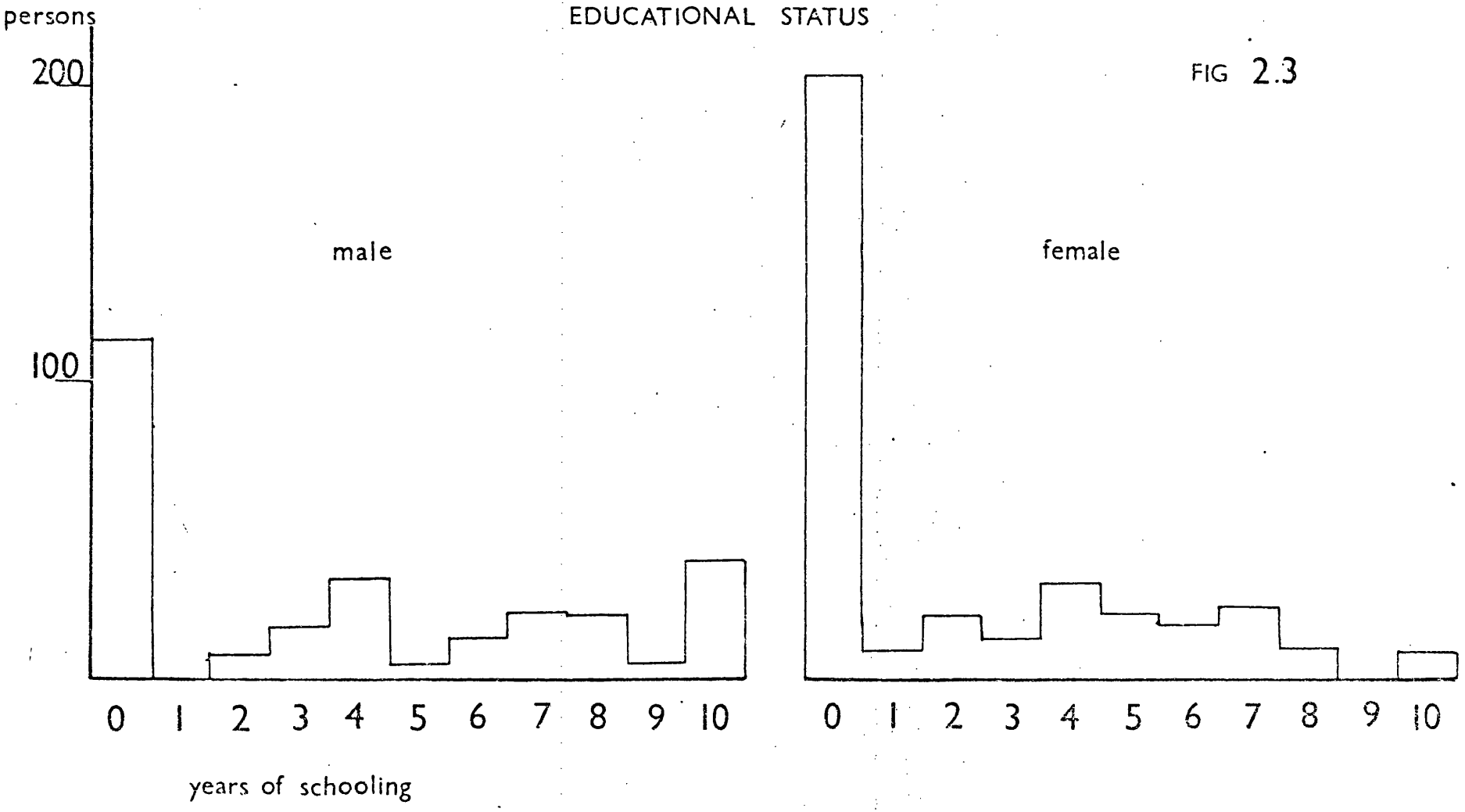
TABLE 2.6

Educational Status of the Permanently Resident Population over 20 years of age

Number of Years of formal education	Male		Female	
	Number	Percentage	Number	Percentage
0	102	47.2	178	59.3
1	1	0.5	9	3.0
2	4	1.9	29	9.6
3	16	7.4	9	3.0
4	30	13.9	19	6.3
5	3	1.4	22	7.3
6	8	3.7	10	3.3
7	10	4.6	16	5.3
8	14	6.5	4	1.3
9	3	1.4	0	0
10	14	6.5	3	1.0
11	0	0	0	0
12	9	4.2	0	0
	(n = 221)		(n = 300)	

EDUCATIONAL STATUS

FIG 2.3



status; this group, of course, received its higher education after Independence.

If one considers the present generation of school children, then one could hypothesise that the age of the child would be correlated with the number of years that the child has received a formal education. Although attempts were made to obtain a rank-size correlation between the position of the child in the family, family ranking and the number of years education, the results were inconclusive. Ideally, one would expect the eldest child to have received the most education, the second in age - the second in education - and so on. This would produce a perfect positive correlation. As primary education is now free, this correlation will eventually exist for the first six years. At first sight, it would still seem likely that the older children would gain more education before the family coffers were drained. However, several factors are disregarded in this simplistic solution. First, the household head might possess no external income to pay the required school fees; some of these schools are boarding schools and the cost is comparatively exorbitant. The sale of the family land to cover the necessary cost of the fees would mean that the family's economic base would be further eroded. Secondly, the increasing size of the family means increasing dependence on the parental income; in most families, the ages of the children tend to be fairly closely grouped so that the maximum outlay on family expenditure could easily coincide with the later education

of the eldest children. Thirdly, the father might prefer that his sons rather than his older daughters receive the benefit of education. The assumption that male offspring are more important than female offspring reflects itself in numerous forms; all families, for example, record the names of their sons first, irrespective of the daughters' ages. Lastly, economic necessity might force the parents to require that their older children seek work to support themselves and the family. Thus a situation might arise where the youngest children had received a better education than the older because extra finances were available.

Case examples might elucidate the complexity of the situation still further. Father A is a widower and has no external employment; he does possess three acres of land which is more than the average size of land holding in Gakarara. His eldest daughter, 28, had three years of education; his second child, a son aged 26, had 4 years education; his youngest child, another son aged 24, had 6 years schooling. This demonstrates the inverse relationship. Father B is a judge in the local court. He is 50 years old and his wife is 38; they have 12 and 7 years of formal education respectively. Both their children over the age of 20 have entered university, though one, a poet, has dropped out, much to the consternation of the father and the village elders. All the rest of their children have received the maximum schooling possible to their age status. Father C and his wife are both over 50 years of age; they have received no schooling.

Their eldest daughter and their third child are in a similar position, having received no education, but their eldest son and second child has received 12 years of formal education.

Two null hypotheses were tested:

A. That there was no significant difference between the families with three or more children and the families with less than three children in respect of the number of years of education.

B. That there was no significant difference between the families with or without an external source of income in respect of the number of years of education that their children received.

Hypothesis A was accepted because the statistic was not sufficiently valid at the 0.5 and 0.1 levels; hypothesis B was rejected at the same levels. This means that the actual total numbers in each family do not influence a child's educational opportunity as much as whether his father has an external source of income (Sillitoe, 1962).

At this point in the argument, it is worthwhile reviewing the major factors concerning the resident population. First, it has been argued that the age-sex distribution of the population is strongly skewed; this exacerbates the problem of subsistence living since the children are consumers, not producers. It is, however, worth recording the influences of the family planning unit in ameliorating this problem. Secondly, it has been

shown that the male population is partly non-resident. The implications of this trend will be discussed later. Thirdly, it has been suggested that migrant males eventually return to their holdings; they are not permanent urban dwellers and they possess strong ties with their home village. Finally, the younger portion of the population has received more education than the older portion, but this simple relationship is distorted in favour of the male population and in favour of the families that possess external sources of income.

It is in the light of such observations that Johnstone's statement about the crucial question of modern sector employment opportunities across family units is pertinent and paralleled by the question of land distribution (Mbithi, 1972).

It has been suggested that all aspects of migration are but facets of the choice that the community has to make to build and maintain external linkages. One of the better frameworks within which to view the mobility of a subsistence population is that of a stress reduction system where the outward migration will approximate the backward migration (Weisner, 1969). Local studies have shown that between 35 and 50 per cent of the adult males are absent form their home at any given time (Ross, 1968), encouraging a quasi proletariat, one which has rural norms and behaviour traits (Johnstone and Whitelaw, 1971). Weisner's matched rural/urban samples indicate that, although single families might have a rural and urban

household, their social focus would be initially and entirely rural. Leys, quoting Ross, emphasises the obvious structural reasons for this, namely the long-term security provided by the land and the network of social relationships within the rural community. This process, the search for a source of urban employment, is identified as the "Dick Whittington" syndrome, reflecting a process similar to that which occured in the United Kingdom.

Ominde surveyed the causes and implications of migration in Kenya and concluded that because of the association of the source regions of migrating population with the major population concentrations, natural factors are important in the mobility of the population (Ominde, 1968). He argues that the primary cause of current shifts of population is the environmental disequilibrium which began with the development of European settlement in the Highlands. The island of European settlement and its economy intensified the gap between the area and the rest of Kenya, thus encouraging the mobility of the population between those two areas. The concentration of investment, the nucleation of industry and the focus of transport towards the urban areas, especially towards Nairobi, can hardly be termed as natural. There is conscious decision to adopt a model of polarised or concentrated development irrespective of the implications that this model has in terms of urban employment, the existence of shanty towns and the ecological devolution of the countryside. Kenyatta and Nyerere have both recognised the limitations of this type of growth policy,

but the divergence between the two answers to the same problem is remarkable. Similarly, the nature of the agrarian crisis is not natural; this crisis which pushes migrant labour towards the towns is the result of a policy decision. The continuation of rural depopulation demonstrates the unwillingness of the Kenyan government to pursue policies that would radically transform the economic life of Kenya but would also alienate foreign investment. Yet, the Kenyan African Agricultural Sample Census demonstrated clearly that land fragmentation is extreme in Murang'a with an average of 3.61 acres per household head ~~but~~ except where large holdings of European estates still exist. Again, the same census underlined the considerable degree of absentee land ownership in Murang'a where 34 per cent of the landowners are absent.

Against this theoretical background, it is useful to consider that part of the community which is permanently away from the village. The definition of a person who is considered to be permanently away from the village is based upon the idea that he is not gainfully employed in the village economy. Any person who returns to the village for only one weekend in a month is considered to be a non-resident. 79 of the household heads are non-residents, but Table 2.7 speaks for itself when it stresses the fact that most of these men are of the age group which could be most profitably utilised in the farm economy. The preponderance of non-resident members of the community in the group between the ages of 30 and 49 highlights the drain on the village labour force; only two of these men are single. The reason for

the external employment of these non-residents cannot be sought in terms of possible higher educational status and consequent job opportunities. A test was attempted on the null hypothesis that there is no significant difference between the educational status of the resident and the non-resident males and this null hypothesis was accepted at the 0.5 and 0.1 levels respectively. In terms of basic qualifications, then, there is no difference between the resident and the non-resident population (cf Tables 2.6 and 2.8). Table 2.9 indicates the type of employment of each non-resident member of the community. Obviously, the educational level of the individual is often tied to the actual occupation he pursues; it is no surprise, therefore, to discover that the professional and the civil servant classes have a higher level of education than do the mechanics and houseboys. What is intriguing is that most of the occupations fall into two groups, administration and transport. In an underdeveloped economy where most production is orientated towards the export of primary produce the major opportunities that are available are those which are concerned with the export market: transport and adminstration are examples par excellence. Over 80 per cent of this non-resident population supports another household in either Nairobi or its immediate hinterland. Most of this non-resident population has only become permanently employed in the last fifteen years; those who have been employed for longer periods are specifically those who have employment tied to the service sector: houseboys, shopkeepers etc. (cf Table 2.10). One

interesting anomaly of these data is the lack of employment gained and held from 1953; this particular era was, of course, the era of Mau-Mau and the policy of villagization was enforced in this area. Fig. 2.4 illustrates the income distribution of the non-resident population. The average income of the non-resident population is 315 shillings; the median and the mode, however, fall into that category between 200 - 299 shillings, emphasising the skewed nature of this distribution. The average monthly remittance to the Gakarara household is, from these workers, 148 shillings; only 5 persons remit 300 shillings or more. The cost of the upkeep of two homes, one in an urban and one in a rural setting, decreases the value of the potential earnings to the rural area. The linkages established with the rural areas are indeed as viable as was earlier suggested. Table 2.11 describes the frequency of return visits by the non-resident heads of households, and the noticeable feature is that the largest single category comprises those who return once a month. All government and many private sector employees are paid monthly and, therefore, it would seem that they are willing to travel to their home village. Group one contains both the unemployed and the higher salaried workers.

This last consideration, that those who return most frequently to the rural areas are those with a high income and those without any income, allows us to build a simple model of return migration based upon the understanding of rural orientation of many of the urban workers. Fig. 2.5 illustrates this concept graphically. The area under the normal curve outside two standard deviations is the

TABLE 2.7

Age Distribution of Non-Resident Household Heads

Age	Number
20-29	8
30-39	28
40-49	22
50-59	12
60 +	9

(n = 79)

TABLE 2.8

Educational Status of Non-Resident Household Heads

Years of Schooling	Number
0	17
1	0
2	3
3	5
4	10
5	5
6	7
7	7
8	14
9	0
10	9
11	1
12	0
13	0
14	1

(n = 79)

TABLE 2.9

Job Delimitation of Non-Resident Household Heads

Occupation	Number	Average Education in Years
Police	1	4.0
Farm Labourer	5	1.8
Transport	18	5.5
Mechanic	4	3.9
Trading or Shopkeeping	13	6.3
Professional	10	8.3
Civil Servant	14	7.2
Houseboy or Watchman	8	1.3
Other	2	5.0
Unemployed	4	0.75

(n = 79)

TABLE 2.10

Length of Time in Occupation for Non-Residents

Years	Number
0-4	15
5-9	23
10-14	26
15-19	0
20-24	6
25-29	4
30 +	5

(n = 79)

TABLE 2.11

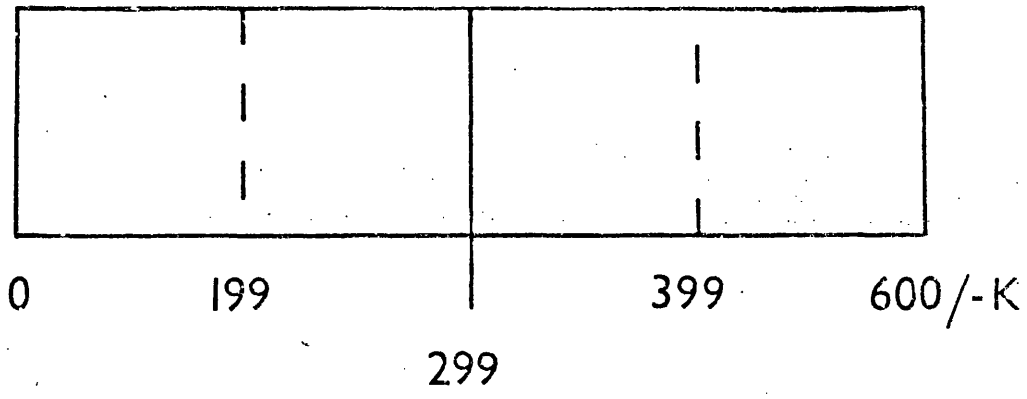
Frequency of Return of Non-Resident Household Heads

More than once per month	9
Once per month	46
Once every three months	5
Once a year	5
Seldom	5
Never	9

(n = 79)

MEDIAN AND INTERQUARTILE RANGE

OF EXTERNAL INCOME

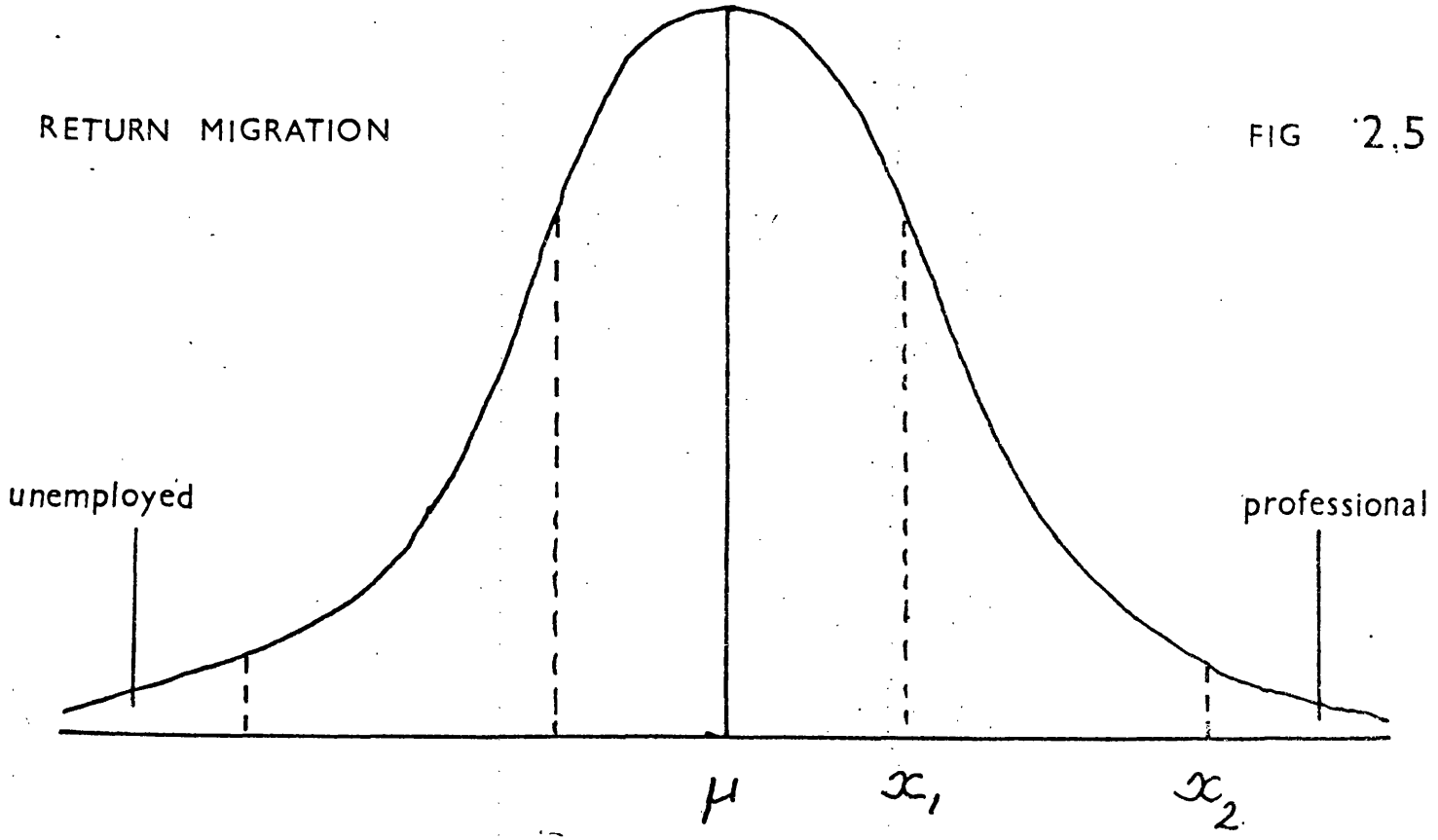


$\tilde{\mu}$ = 315/-K

FIG 2.4

RETURN MIGRATION

FIG 2.5



315/-

area that will contain the sections of the urban population mentioned, the élite and the unemployed. The élite will return because they can afford the time and the money to strengthen their rural ties, more particularly to invest their income in land as a form of social security. The unemployed, meanwhile, are a greater burden on the urban dwellers with whom they are staying than they would be on the holding in the village; at least in the village there is a certain amount of seasonal work that must be completed in the agricultural sector. For different reasons, these two classes of the urban migrants frequently return home.

A series of pen pictures will reveal the great range of rural ⌢ urban and urban ⌢ rural contact that occurs among the non-resident household heads. Worker A is 40 years of age. He has had eight years of education and managed, through his uncle, to obtain employment as a civil servant in Nairobi. From his monthly wage of 500 shillings he manages to remit 300 shillings; at present he is attempting to buy more land in Gakarara. Worker B is a mechanic even though he has had seven years of education. Unfortunately he had no deus ex machina and had to take the only employment opportunity that came his way. He earns 200 shillings but never manages to remit any back to Gakarara. Worker C is unemployed at the moment. He has no formal education and for the last twenty years has spent his time in Nairobi in a continual search for casual labour. Workers A and C return much more frequently to the home village than does Worker B.

Besides the non-resident population, which has external sources of income, there is a total of 56 other people who have income from a source of employment other than the family holding. This means that 46 per cent of the families in this farming community have a major income which is not directly derived from their shamba or farm. Fig. 2.6 and Fig. 2.7 express the type of employemnt and the monetary return for total external employment. Similar characteristics to those discussed above will be noted first, the concentration of the occupations into the catogories of administrative and transport employment and, secondly, the fact that the mean return of 300 shillings plus is useless as a measure of central tendency because the distribution is so skewed. The wage returns do not differ considerably from those recorded earlier. Most of the group of 56 work in the new industrial town of Thika, leaving at dawn and returning at dusk to the village. Considering that there is 46 per cent of the household heads permanently employed outside the village's economy, it is not surprising that soil erosion is the order of the day because there is little surplus labour available to terrace the valley slopes. With many male members away from the village, there is indeed a tendency for the agricultural economy to deteriorat

This tendency is multiplied because, although the women are left to tend the fields, as well as the family and the house, many prefer to work on the coffee estates where they can command 60 cents per debe, a cubic measure of 5 gallons, for picking beans; for a full day's work

EMPLOYMENT TYPOLOGY

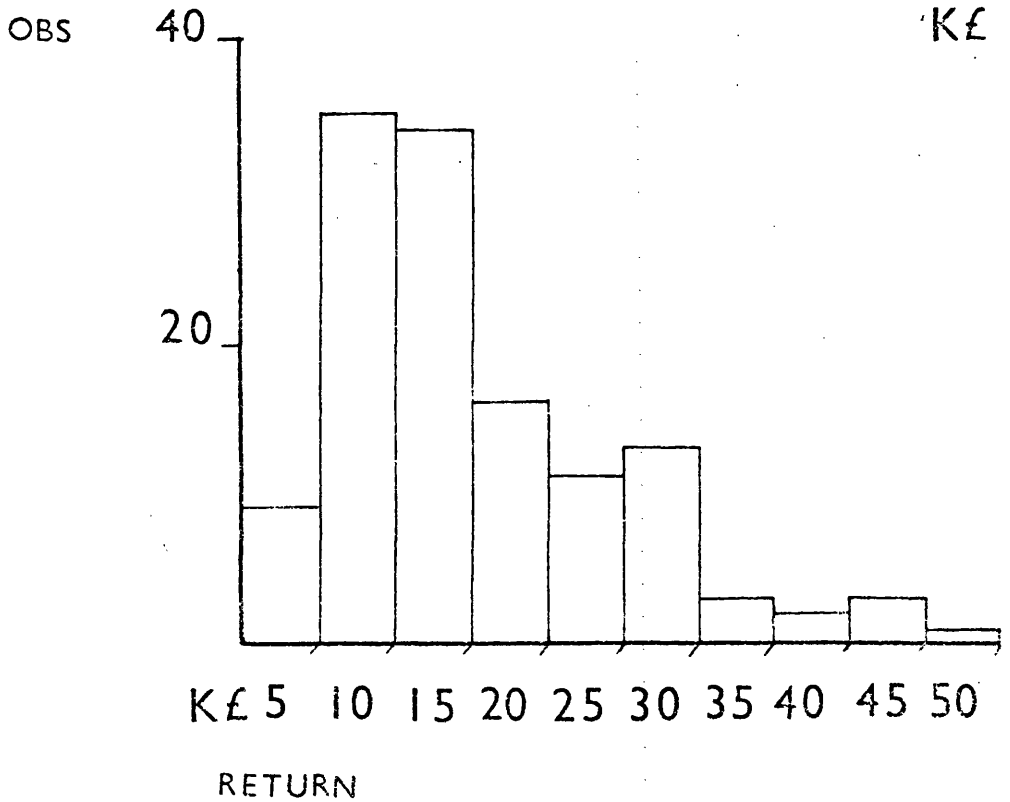
FIG 2.6

key overleaf

KEY TO FIGURE 2.6

1. Army, Police, Prisons.
2. Farm Worker.
3. Transport.
4. Builder.
5. Trader.
6. Professional Class.
7. Civil Servant.
8. Houseboy, Cook.
9. Other.
10. Unemployed.

RETURN FROM OUTSIDE LABOUR



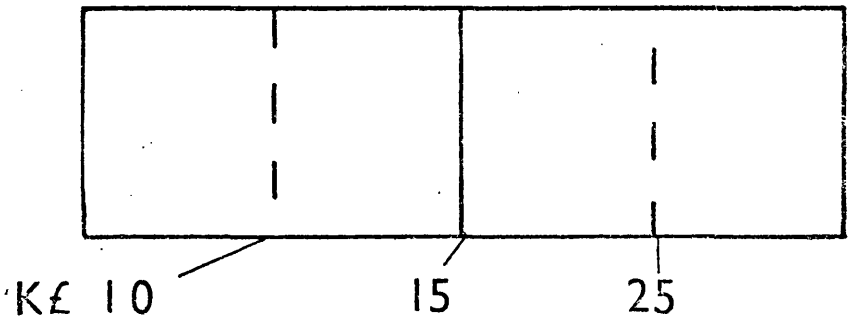


FIG. 2.7

they might earn six shillings. The work is seasonal but the labour drain occurs at the time when the most labour is needed on the family holding for terracing, planting and harvesting. Only the women who have children returning from primary school for a mid-day meal are apparent in large numbers around the village. This is a very small proportion of the total labour force that should be available for the development of the village's agriculture.

Six women specified that they have gained some external income from the traditional work of hand weaving. There is a growing market for this produce in Nairobi. Only two of the household heads had wage employment in the village. Both of them were stone masons or, rather, stone dressers who exploited the stone bluffs at the small waterfall on the Thugi river.

In the present political climate of Kenya it is difficult to visualise how the vital role of rural industry integrated with agriculture could be appreciated, let alone encouraged. Theoretically, the industry could be closely linked to the potential agricultural output and thus partly ameliorate the vagaries of the climate. The Rural Industrial Development Strategy, however, indicates that divisions are too small an administrative unit to justify the expense of a single R.I.D.A. development service per division. Murang'a is the local centre for Gakarara even though it is designated as an urban area in both the Physical Plan of Central Province and in the

Five Year Plan. Murang'a appears as a distant urban industrial estate to the villagers of Gakarara.

One of the more revealing indicators of the lack of employemnt opportunities is that, when the household heads were asked whether or not they had a son over the age of eighteen years who was employed, 26 per cent of them claimed that they had. This part of the survey was carried out in August when the European farms were seeking temporary piece-rate labour. Two-thirds of the unemployed youths were said to be "doing nothing"; only 15 per cent of them did any work on the family holding. It is difficult to visualise the type of industry that would be sufficiently attractive to entice the migrant back from the city where he is willing to court unemployment in the hope of greater opportunity. More specifically, what kind of rural industry will provide sufficient stimulus to bridge the gap between rising expectations and the reality of the peasant's economic situation?

There are several considerations that need restating before the question of politics and land is analysed. First, the general distribution of population in the village is heavily biased by the number of dependents, those who are under nineteen in the total population. The household heads are encouraged to seek outside employment to reduce the economic pressure on themselves and on their families; this means that the male labour force available to the village economy is more than halved. The cost inherent in sustaining two households, one in the urban and one in

the rural setting, absorbs much of the cash income that was initially sought to help the family. Educational opportunity is tied to external employment because it is difficult to complete the secondary part of the schooling process without a consistent source of income to pay the necessary fees. Education, however, does not guarantee employment. Even if occupations are available, they are likely to be in the transport, administrative or service sectors, sectors which predominate the Kenyan economic structure because the economy basically relies on the export of primary produce.

CHAPTER THREE

VILLAGE POLITICAL PERSPECTIVES

Western writing on economic development in Africa sometimes displays a disconcerting naivety, suggesting that development can take place without any reference to the political context. Important insights can, however, be gained if one examines the political aspects of the development process and this will be done with reference to Gakarara village.

Kenya achieved independence in December, 1963. At that time, income per capita was approximately £40 per annum, twice that of neigbouring Tanzania. Leys (1972) emphasises that the economy at this time was distinctly dualistic, the monetary section of the economy accounting for an estimated 73 per cent of the total output while manufacturing, building, electricity and water supplies accounted for another 10 per cent of the total gross product. The processes of growth and modernization have proceeded steadily throughout the whole country but there has been no real change in the structure of the monetary economy. The economic limitations imposed by the East African Common Market, the necessity to transfer with minimum disruption the colonial economy to the Kenyans themselves, and the desire to maintain an overall rate of expansion - all have ensured the stability and consolidation of the colonial economic structure. Any analysis of underdevelopment would of course predict this

situation. Leys interprets the situation clearly enough when he argues that:

> "the economic surplus produced by the vast mass of the productive workers, the small farmers, is being extracted by the adverse terms of trade with the developed countries, partly by the high profits of expatriate firms which are largely repatriated overseas and partly by the import consumption orientated expenditure of the skilled workers and the salaried employees instead of going into productive manufacturing investment and the development of a domestic market for local produce" (Leys, 1972,74)

Arrighi and Saul (1969) have analysed African peasant society and concluded that the medium term destiny of the African countries is to remain underdeveloped and not to acquire a preponderant urban wage sector. Leys follows this argument by stressing that:

> "one can not help feeling that in Kenya at least the character of politics for some time will be determined by the fact that the peasantry as a class has not yet reached the limits of its development and that the symbiosis between it and the emerging working classes has not yet fully developed" (Leys, 1972,21).

It is obvious from these remarks that, although there are elements of 19th century economic experience in present Kenya, no distinct class has emerged nor is likely to do so in the near future: the situation is, however, fluid and dynamic and has ominous implications for the rural peasantry.

The two major characteristics of the Kenyan colonial legacy can be defined as the nationalist movement and the institutional framework for government.

The nationalist movement, Mau-Mau, was the most important and certainly the most distinctive feature of the Kenyan political scene in the 1950s. It was armed resistance to white colonialism, the only example of armed insurrection in Africa at that time. Venys (1970) pointedly focuses attention on the fact that only 8 per cent of the country was involved in this uprising but, more importantly for our purposes, that the population involved was almost totally Kikuyu. Gertzel (1970) has pertinent comments to make when she says that there exists a strong sense of localism out of which has grown the tradition of decentralised political power. Party institutions were consequently weak in organization. The legal and administrative inheritance was in contrast very different. It left Kenya with a strong, centralised hierarchical machine that over the years provided an effective counterbalance to localism, the grid that held the country together.

What is immediately obvious is that the two legacies are in some way contradictory. Leys, however, gives a wider perspective to the Kenyan situation when he comments that there is really no old order in African politics at the national level (Leys, 1972). Kenya, like other African countries, suffers from the fact that colonialism was a 19th century European phenomenon; colonial conquest gave African states their first experience of any national government. The author also comments on the side results of such an administrative inheritance when he stresses the dyadic, the client-patron relationship, that links

the peasants, locality by locality, to the politicians: this is a weak, unequal relationship for the political machinery itself is weak, yet Leys suggests that it can be viewed as paralleling the clan or lineage system.

In contrast, the bureaucratic machinery is strong. Not only has it retained all the powers bestowed upon it at Independence and regained other powers, such as the supervision of the police, but it has also established control over areas that have long been outside the jurisdiction of the central administration such as the responsibility for rural health, roads and primary schools. Numerous changes have been defended on the grounds of security and efficiency, but this does not alter the fact that local government has been rendered sterile. In terms of rural development there is a distinct lack of channels or agencies for improvment or complaint except for the jejune KANU party or the civil service. Attempts to strengthen and encourage national consciousness have produced greater bureaucracy; the process of nation building has been one of disciplining and subordinating the party to government, overriding the nationalist legacy in favour of the colonial heritage, in an attempt to reverse the tradition of decentralised political power that grew in the nationalist movement. In a sense therefore, even though the two legacies are contradictory, the power of the political élite hastens the growth of the centralised administration.

Any consideration of traditional Kikuyu social and

political organization orientates the researcher towards an anthropological study of power based on the clan and lineage system. Kenyatta (1938) maintained that traditional government was based on true democratic principles, but Middleton (1953) does not agree. However, both these authors, as well as Lambert (1956) and Fisher (1955) agree that there were three grades or lodges that could be delimited in traditional Kikuyu, namely preinitiation, warrior and elder grades; the circumcision ceremony was the only qualification which gave a man recognition of his manhood and the right to full citizenship, warriorship and eldership. These age grades have ceased to carry much importance, for school has obliterated the preinitiation grade and independence has wiped out the utility of the warrior grade. Similarly, various aspects of the traditional organization have completely disappeared such as the religious sacrificial council and the military organization; traditional legal practices have ceased to exist altogether.

Even the traditional leaders and their roles have disappeared in modern Kikuyu society. Middleton indicates that many earlier writers stressed the importance of chiefs as political leaders (Middleton, 1953): for example, Kenyatta eulogizes Wangombe (Kenyatta, 1912). It does therefore seem that they were important in the indigenous system of government and that the colonial government later used them to control and stabilise the population. Leakey presents an alternative viewpoint when he categorically denies that the traditional Kikuyu society had chiefs, but

this view is seldom given serious consideration (quoted in Middleton, 1953). Lambert talks succinctly about the distinct role of chiefs in traditional society and he discussed the appointment of such men (1956). A leader, he argues, was a spokesman who appointed himself at childhood by his dominance within his own age group. Leadership was, therefore, a matter of personality and ability but, as certain functions were restricted to certain age groups, the natural leader was hurried along the road to seniority. Certain clans or subclans were associated with the hereditary qualities of leadership. Later, under colonial rule, the appointment of the chiefs was the prerogative of the adminstration and government; already the role of chief had become a purely bureaucratic one.

The modern leadership element is quite differently determined. Stockton indicates that, although equality of opportunity might exist under the law, reality is starkly abstracted from that model; the problem of organising a modern society so that everyone has access to the policy makers is seemingly impossible (1970). Migration, which was discussed in the previous chapter, dictates the composition of the rural leadership; the availability of personnel determines the composition of the élite. Three major groups were discussed in Stockton's paper, and it is these groups that he regards as dominant elements in the rural leadership:

(i) Younger, educated people, 30 to 40 years of age, who are employed locally as teachers or as government agents.

(ii) Mature, though not aged people who, in their youth, worked in the towns or on European farms but who have returned to their rural homes.

(iii) Old people who lend the dignity of age and wisdom to any meeting or discussion.

In discussions of pre-mass media society in rural areas, it has been indicated that the man who can discuss and interpret national affairs enjoys a degree of status greater than that of his less well-informed peers; this observation holds true for contemporary Kikuyu society. Stockton has also suggested that different respect would be accorded to the various leaders depending on their role in the independence struggles: i.e. those who were attached to the Mau Mau would enjoy more prestige than those attached to the Home Guard. He attempts to measure his hypothesis, albeit within a poor statistical framework, but produces no significant results; he concludes that such a long time has elapsed since independence that there has been some reconciliation between the former opposing elements and a clearer recognition that all Kikuyu suffered under colonialism. It is unforturnate that his research design is in no way comparable to the argument that he offers for the respect given to the leaders of the various age-experience groups quoted earlier.

Rural leadership is not, however, the most important variable in the political life of the Kenyan communities. As has been emphasised before, the administrative framework is obviously the most important variable in determining Kenyan rural development. In the political microscale, the

most senior person is the District Officer who supervises the collection of the Graduated Personal Tax, the maintenance of law and order and the welfare of the community within a division. Gertzel has an interesting observation on this point:

> "The root cause of the friction that developed between the Administrative Officers, the party officials and the M.P.s was the fundamental question of leadership within the community for the decision to use the provincial administration as the agent of executive power meant that there were two groups of men in the country each of which believed it could legitimately claim to lead the people"

Brokensha and Nellis (1972) attempt to determine the leadership structure of the lower echelons of political power, starting their analysis at the apex of the local administrative hierarchy. Important to any understanding of the supervisory role of the most senior men in the local administration, the District Officers, is the District Officer's perception of the quality of his chiefs; significantly, the District Officer values local cooperation highly indeed. How well do they collect taxes? How often do they provide accurate information about local conditions and opinions? Are they keen on self-help projects and do they push primary schools and water projects for their locations? The reason for such concern can be understood if one appreciates the dichotomy of roles between the District Officers and the chiefs. For the most part, the District Officer's perspective is upward and outward; as a group, they are predominantly young, English speaking and generally considered as the bright executives of the civil service. In contrast, the majority of the chiefs

are not of the same calibre. The chief is the local broker translating the demands and services of the national administrative mechanism into comprehensible local terms for his own location. He acts as a go-between, establishing local contact with the central machinery, but there is no reciprocal arrangement to encourage wholesale grass-roots political activity. This is an important distinction, because to many peasants in the rural areas, Government is Government - an extractor of resources and sometimes a giver of services, but still something remote and mysterious. Such problems as witchcraft, dowry collection, circumcision matters, land disputes or simply liberal advice consume a major proportion of the chief's time. At monthly intervals, or even more frequently, the chief holds a barazza, a meeting, with the elders. The barazza is yet another institution through which the rural area, the periphery, is linked to the centre. These meetings are to be seen as agents of administrative and political penetartion but it is suggested that the communication is only one way and that little popular participation occurs. Electoral selection for the chief's office has been discontinued because the central administration became acutely conscious that local factions might hinder the election of a suitable candidate. Basically, therefore, the role of chief has a dual function, discipline and development, but the former seems to be the prédominant consideration.

The subchief's role is basically to ease the workload of the chief within a particular sublocation (cf Fig. 3.1).

They organise tax collection, maintain law and order and encourage self-help projects aided by the local village elders. Various other leaders exist within the more senior local bureaucracy, notably agricultural extension officers who consolidate and entrench the administration's control of the rural development programmes.

One important aspect of local leadership is that which Weber defines as social power, the chance or opportunity of a man or a group realising its own will in communal action even against the resistance of others who are participating in that action. Hyden observes that there is a need for such a concept if one considers the role of leadership in the cooperatives (Hyden, 1970). Olewe, however, stresses that at the present time the distribution of rewards highly favours the most prominent members of local communities, including committee members and staff, teachers and traders, some of whom might not even be members of the cooperatives (Olewe, 1972). This would suggest that bureaucratic power exceeds any potential social power even in something as fundamental as a cooperative; later it will be shown that Gakarara itself does not seem to encourage the growth of this particular form of leadership because of the existence of one particularly powerful group. Ojewe argues that development planning must take the form of increasing the peasant's capacity to solve his own problems; he emphasises that informal leaders, those from whom other members of the social system seek information and advice, are

introducing more innovations than the official extension officers.

It is clear from the preceding section that the present form of leadership seems to encourage the dominance and domination of the central administration in all walks of rural life, especially that of development. Eventually, therefore, one is forced to consider centripetal tendencies, to consider if Kenyan democracy is developmental. The experiences of China and Tanzania should demonstrate that only if there is participation at grass-root level will development occur. Oyugi (1972) postulates three conditions for success in the Kenyan context:

(i) positive orientation by the political leadership and the political system to the mass of the people,

(ii) the existence of formalised and institutionalised provisions to implement this orientation,

(iii) a deeper understanding of the ability of people to participate.

These proposals would suggest that the present planning structure is relying disproportionately on the strength of the government and that the government will have to take positive action to ensure greater participation by the masses. What are the present government proposals to rectify this situation which, it is suggested, is suffocating rural development?

Although the focus of the administration might be changing, the power of the centralised bodies is growing at the expense of the peripheral areas. Thus more impetus

to the developmental process will be given by accelerating the shift of emphasis in the work of the provincial administration in which the principal objective will be to achieve rapid development to raise the people's welfare. The traditional colonial emphasis on the maintenance of law and order will be changed to give additional emphasis to the administration of development. The administrative machinery must be development minded and adequately informed about the country's development problems in order to seek solutions to these problems at local levels.

In fact, in the current development plan the government makes it very clear in the first sentence opening the discussion on rural development that the objectives of the national development is the economic and social transformation of the people (5YP, 1970, 3). The determined political control that the government maintains at the local level, through the use of provincial administration, makes this objective unlikely if not entirely remote. The central authority argues that their experience with self-hel groups and participation planning proves conclusively that local people are poor planners; this experience has hardened the government's attitude so that they feel they can say without fear of contradiction:

> "in order to make the maximum contribution to the nations effort for more rapid economic and social development, the growing self-help projects must be planned and directed...they must be planned and directed so that they are consistent with the National Development Plan" (5YP, 1970, 233).

Several points of interest have emerged in this

discussion. First, Kenya has a colonial legacy that expresses itself in two ways - namely the bureaucratic strength of the central administration and government and the relative weakness of one political party. Secondly, leadership in the development programme is the prerogative of the few; this group is distinguished not by its control of traditional authority but by its control of the local administrative roles. Lastly, the government is making conscious efforts to rationalise the rural development programmes and thus, perhaps unwittingly, concentrating the power into the hands of a small élite.

Soja's factor analysis (1968) of the indices of modernization in Kenya indicates that Murang'a contains the most conservative core area of Kikuyu, has had less contact with European farming or the towns and has generally been more resistant to change. The area ranks 13th on the list of factor scores and is lowest on the African subsystem; this means that there is a high population density, great ethnic homogeneity, a high level of educational development, an early beginning to political activity and a relatively high standard of African wealth.

Kandara is one district within Murang'a. The present district officer is almost a caricature of the senior official that was described previously; not only is his perspective "upward and outward" but his other qualities match the pen picture that was made of the typical district officer. After graduating in law from Dar-es-Salaam, he

began to pursue a career in the civil service. His ability and ambition are extremely high and as far as the local peasants are concerned his only failing is that he is non-Kikuyu.

Chief Muraka is the chief of the Muraka location which contains sublocation 4, Gakarara. This man is also a very capable administrator who has had previous experience as a leading cooperative official. It was, for instance, in this capacity that he paid a working visit to Israel some years ago. Although he is generally respected throughout the whole location, there are some of the older men who do not think that he is the best appointment as a local chief because he was not a prominent member of the Mau Mau. This condemnation is meaningless, however, because the appointment to a chief is an administrative and not a traditional decision. Chief Muraka is considered highly by the local administration and to him falls the task of organising many of the division' meetings, e.g. when more senior government officials, such as the District Commissioner, arrive.

Kibaki is his subchief within sublocation 4, the area of Gakarara. The subchief is really the position in the hierarchy where the control of the central administration finally peters away. In this particular instance, the subchief is notoriously ineffective from the administration's point of view. Not only is he ineffective in his tax collection, but he is also often accused of accepting bribes to pervert the course of justice. He is, however, a

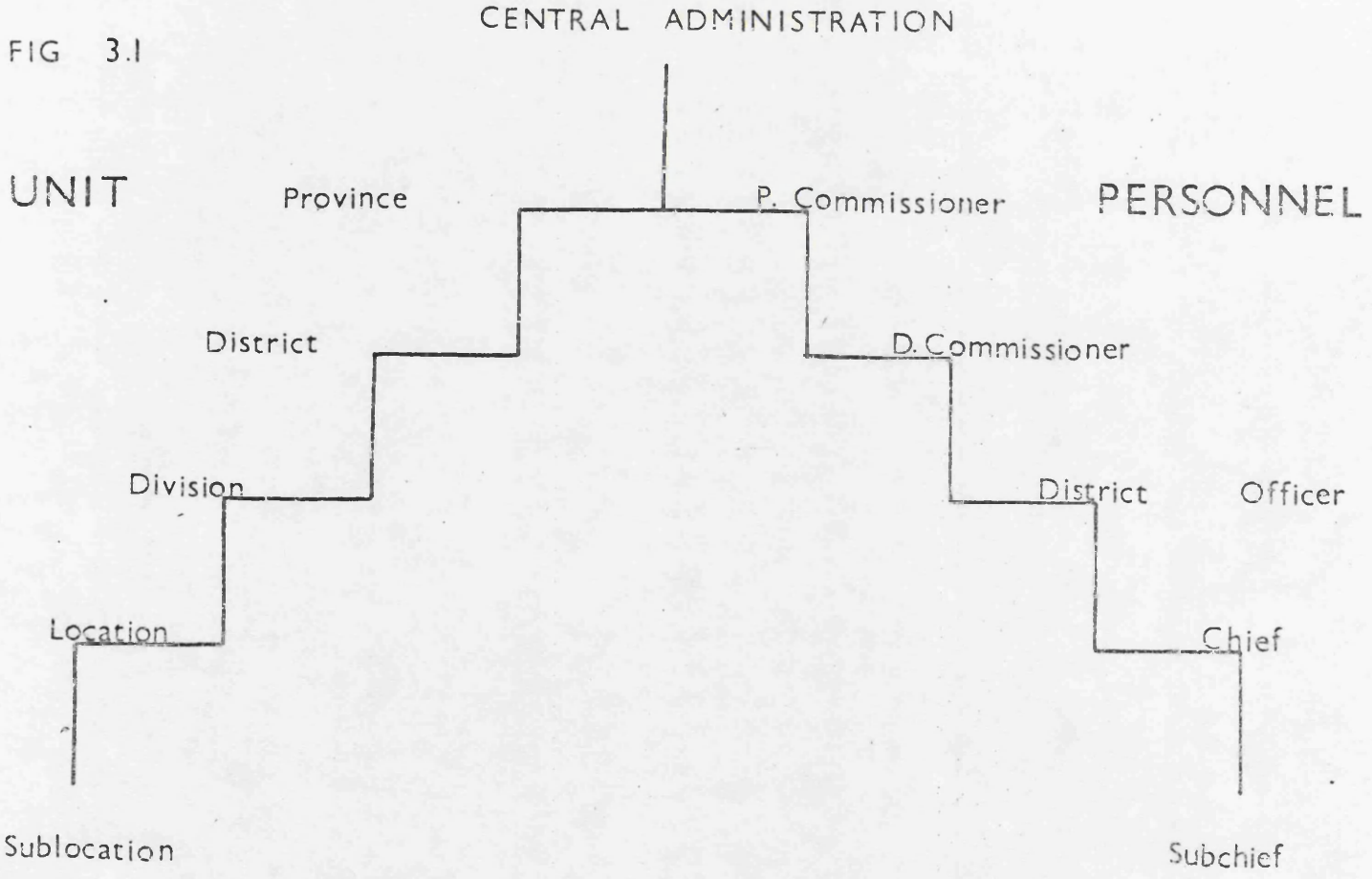
popular local business man with many interests outside the village. Much of the energy expended by the chief in encouraging local projects for development is dissipated between himself and the subchief and consequently the villagers (cf. Fig. 3.1).

The village's population was surveyed to determine its political composition. As before, the area was totally sampled in terms of 300 spatially contiguous households.

The number of interviewees who consider themselves as leaders within the community is a small but powerful élite. 13 per cent of household heads consider that they are leaders within the local community and another 17.3 per cent regard themselves as important committee members. A two by two Chi square test indicates that there is no significant difference between these two groups at the 0.5 and 0.1 levels - i.e. that the personnel of the groups of leaders and committee members is exactly the same. The only addition is the inclusion of some committee members of the women's groups. This type of political composition is, of course, a prime example of the élite structure discussed earlier.

Consideration was given to the village's perception of leadership. All the interviewees were asked to indicate whether they regarded the interviewee as a leader. The interviewers themselves were inhabitants of the village, albeit educated, and they gave serious consideration to any leadership claims. By this time, it had already been

FIG 3.1



POLITICAL HIERARCHY

determined that the leaders and the committee members ran an almost closed shop; a member of the primary school board would be the chairman of the women's group etc. The interviewers considered that 15 per cent of the population surveyed were either on committees or were leaders. Again, a null hypothesis was established that there is no significant difference between the interviewee's response and the interviewer's perception. Because the Chi square value is 0.54, this hypothesis cannot be rejected at either the 0.5 or 0.1 probability level and therefore these two populations may be declared similar.

The frequency of meetings of these leaders is tabled below, but this table only includes the number of formalised or structured gatherings (Table 3.1). It excludes the wider, more colourful meetings that concern the whole population and are usually held in Kandara. Moreover, it does not attempt to quantify the more numerous ad hoc discussions that emanate from casual meetings; in a peasant society this is one of the most striking ways in which information is disseminated, the so-called "bush-telegraph".

One immediate question arises. What exactly is the purpose of the committees? Table 3.2 indicates the types of committees with which the élite are concerned. The most striking affiliation is that to the women's groups. It is crucial to any understanding of Kikuyu peasant existence that the importance of women for rural development is realised. Not only do they have the responsibility for the rearing of children and the general household duties,

TABLE 3.1

Frequency of Meetings

Frequency	Percentage
Once a week	73.1
Once a month	15.4
Less Often	7.7
No Reply/Don't Know	3.8

(n = 52)

TABLE 3.2

Typology of Committees

Type	Percentage
School	13.46
Church	13.46
Women's Guild	59.62
Shamba Group	3.85
Cooperatives	1.92
Other	5.77
No Reply	1.92

(n = 52)

but they are largely responsible for most of the agricultural work. Although men chair the women's groups, most of the senior committee roles are filled by women. However, the organization of these groups is a comparatively recent innovation, spreading rapidly in the area in the last four years. The range of activity encouraged by these women's groups is extremely wide. Their primary purpose in this village is to foster health education, but the spectrum of orientation widens to include a general education programme. Closely associated with these groups are the shamba groups. These have been encouraged by the central administration in Kandara and have successfully innovated labour-sharing and cooperative practices; perhaps the most striking cooperation is visible among six women who have recently bought cattle and are grazing them together to provide milk for all their children. Although the political power that accrues to women is negligible, their enthusiasm for participation in every walk of communal life is boundless. The regularity of these meetings, particularly of the women's groups, indicates the willingness of the leaders to appear concerned.

The leaders of the church and school groups contain the same personnel; to them falls the major responsibility and respect. As the primary schools are a section of the government's brief, it means that these leaders have direct access to the administrative machinery. Similarly, the sponsorship of the secondary school by the Bishop of Murang'a consolidates the relationship that exists between secular and religious interests at the grass-root level. The local

chief chairs many of these meetings even though he lives in a different part of the location. The power of the whole group of leaders is overridden by a group of elders who gained respect through their association with Mau Mau during the Emergency although they hold no definite public office. Before considering this unique element, it will be necessary to determine the quality of the official leadership.

Converstaion with members of the Political Science Department and of the Institute of Development Studies in Nairobi and later with the District Officer of Kandara indicates that the major determinants of leadership quality are likely to be age and religion. Personal field observation and experience concurs and emphasises the validity of these hypotheses and information was gathered to quantify the exact nature of this relationship.

Chapter two deals more specifically with the age structure of the whole population. All that needs emphasis here is the general nature of the age distribution, notably the absence of young married men. Table 3.3 indicates the age groupings of the leaders. The figures are not difficult to interpret as percentages because the predominance of the older elements in the leadership or élite class is obvious. More difficult to determine, however, are the reasons for this predominance. A simplistic solution that there are more old men with more free time is discounted, for the villagers themselves do not regard this as a plausible explanation. More importantly, the

villagers emphasise the respect they had for this older element not solely because of age that they would traditionally respect but because of active involvement in the fight for independence. On several occasions it was intimated that these older people were close associates and contemporaries of the senior men in the Kenyan national government and that they had immediate access to the highest corridors of power to air their grievances. Various instances were cited to prove this point and two of them are detailed at the end of this section. Yet in the process of establishing why the older men should currently enjoy such respect, another important issue was raised: why were the remnants of the freedom fighters left to their peasant life while their compatriots enjoyed the fruits of independence?

Again, it was the local people who provided the insight by illustrating the fact that the most successful politicians are educated whereas the older local leaders are largely illiterate. The general educational status of the population has been discussed previously but the main points can be re-emphasised. The building of the first African school in the village gave early encouragement to the local population to educate themselves. However, then, as now, not everyone had the opportunity for secondary school education; those who did in fact receive that education grasped the opportunities presented by urban wage employment and migrated from the village. Table 3.4 indicates the educational status of the leaders and it is worth noting that a similar percentage, 48.8 per cent, is recorded for

the number of leaders without education and those over 61 years of age.

Educational opportunities offered the chance for any person to gain a formal knowledge of a language other than Kikuyu; outside contact enabled the people to utilise their knowledge of other languages, for formal and informal contacts. Table 3.5 contrasts the percentage of household heads and leaders with respect to their ability to speak one or more language other than Kikuyu.

It is necessary for most of the leadership to speak at least Swahili for administrative purposes; much official local government communication is carried out in Swahili although the local District Office in Murang'a has started a monthly newsletter in Kikuyu. Many of the older leaders protest that they do not speak Swahili although they seem to understand it perfectly. Primary school education now includes Swahili as a compulsory course unit.

Table 3.6 considers the percentage of household heads and the percentage of leaders who have worked away from the village. One comment can be made, namely that this particular relationship is the reverse of that demonstrated in the previous table. It is suggested that those who remain within the village are more likely to become leaders and exert a more powerful leadership because they are in contact with the people who have given them responsibility.

The major conclusions to emerge from this section

are best reconsidered before any attempt is made to tackle the more complicated question of religion. First, it appears that most of the leaders are the older element of the village's population, respected for their age and involvement in the independence struggle. Secondly, many of these leaders, particularly the older element again, do not boast any formal education. Thirdly, many of the leaders do not and cannot speak a second or third language. Lastly, the lack of outside experience is not a stumbling block but, conversely, it seems to encourage the general populace to have more confidence in the political perspective and judgement of their leaders. These conclusions seem to bear emphasis because they stress the same correlations that have appeared in the literature cited.

The remainder of the results of the political questionnaire are outlined below and indicate that the hypothesis outlined previously, that religion is also an important determinant of leadership, is correct.

Initially, it was necessary to determine which members of the village attended church. 87 per cent of the population had a declared religious affiliation; this represents a considerable section of the community (Table 3.7). More intriguing, however, was the division of the community into the individual religious affiliations (Table 3.8). The predominance of Roman Catholics is directly attributable to the location of the local Catholic church and presbytery within the village. In fact, because the secondary school is financed by the Bishop of Murang'a,

TABLE 3.3

Age Groups of Leaders

Age Group	Percentage
Less than 30 years	11.1
31-40	13.3
41-60	31.1
More than 60 years	44.4

(n = 45)

TABLE 3.4

Educational Status of the Leaders

Educational Status	Percentage
No Education	48.8
Less than Two Years Education	8.8
3-6 Years Education	24.4
7-10 Years Education	15.6
More than 11 Years Education	2.2

(n = 45)

TABLE 3.5

Ability to Speak more than One Language

Reply	Percentage of Household Heads	Percentage of Leaders
Yes	67.7	77.8
No	32.0	20.0
No Reply	2.2	0.3
	(n = 300)	(n = 45)

TABLE 3.6

Experience of Work Outside the Village

Reply	Percentage of Household Heads	Percentage of Leaders
Yes	43.6	33.3
No	56.0	64.4
No Reply	0.3	2.2
	(n = 300)	(n = 45)

there is further encouragement for the population to embrace Catholicism. A small proportion, 18 per cent, belong to the Independence Church but their influence extends beyond their numbers.

The fissiparous nature of religious sects in Africa is often commented upon by church historians and others (O'Keefe and Landy 1969). Among the Kikuyu such religious cults or Independent Churches are quite common. These religions or dinis are a blend of Christianity and tribal beliefs offering a passive resistance to foreign medical aid and methods of disease prevention, refusing to wear European clothes and to buy foreign goods. Rawcliffe comes to an interesting conclusion when considering the development of Watu wa Mungu, one of the most important Kikuyu dinis, after the Second World War, when he suggests that this sect was divided into two subcults; one was called Dini ya Jusu Kristo and the other was the political terrorist movement known as Mau Mau (quoted in Venys, 1970). If this suggestion is accurate then it becomes easier to appreciate why the influence of the Independent Church is so great.

Church attendance has a secular as well as a religious implication. It was necessary to determine how frequently the community attended church and the influence of the Christian calendar of worship (Table 3.9). The secular functions of these weekly meetings is extremely important. After attending church services, the congregation will meet outside the church to exchange views and opinions,

often for several hours. The major topics of conversation tend to concentrate around important everyday issues such as farming, health and clothing. A section of the questionnaire was devoted to exploring the nature of these conversations but nothing more than the broad divisions outlined were elicited. Members of the Independent Church often hold vehement discussions about politics (Table 3.10).

Generally, the result of religious questionnaire in the village indicate a high level of religious participation. The religious affiliation of the leaders in the society is significantly different from the religious affiliation of the general populace. Table 3.11 shows the religious affiliation of the leaders to the various denominations. What is most interesting is the fact that 73.7 per cent of the leaders who belonged to the Independent Church are over the age of 40 years. The older leaders have a marked affiliation to the Independent Church; the leadership element, a group delimited by age and religion, is not the most vociferous group but, in village terms, they possess absolute power. Several examples will demonstrate this point.

In the last year the District Officer was forced to take action against some of the older men in the area, supposedly this powerful group of leaders, when accusations were made that these men were involved in reviving the traditional oath-taking ceremonies. The truth of these accusations was never established but, nevertheless, rumours abounded about the reasons for the revival in

TABLE 3.7

Number of People who Attended Church

Those Who Attended	87.0
Those Who Did Not Attend	12.66
No Reply	0.33

(n = 300)

TABLE 3.8

Religious Affiliation

Denomination	Percentage
Catholic	63.00
Independent	18.00
C.C.M.	8.33
No Reply	10.66

(n = 300)

TABLE 3.9

Frequency of Church Attendance

Frequency	Percentage
More Than Once Per Week	1.66
Once Per Week	84.33
One to Three Times Per Month	0.66
Less Often	0.33
No Reply	13.00

(n = 300)

TABLE 3.10

Matters Discussed at Church

Matters	Percentage
Only Farming	11.00
Farming and Health	58.33
Clothing	6.66
Other	8.66
No Reply	15.33

(n = 300)

TABLE 3.11

Religious Affiliation of the Leaders

Affiliation	Percentage
Catholic	51.11
C.C.M.	6.66
Independent	42.22

(n = 45)

these traditional ceremonies. Two explanations seem most plausible that, first, the older people seem concerned about the establishment of a birth control clinic at Kandara; the success of the clinic is viewed as a distinct threat to the numerical supremacy of the Kikuyu. Secondly, the older population is aggrieved by the appointment of a non-Kikuyu and young Kikuyu to senior government posts who, in this instance, are said to be Moi and Mungai respectively. Although the issues and the persons discussed in this anecdote appear somewhat nebulous, the reticence of the administration and the villagers themselves precluded further investigation.

Another example of this group's authority surfaced when the District Officer, a non-Kikuyu, took his annual holiday. For several years, the members of the Independent Church had argued fiercely for their churches to be restored. During the Emergency, the British authorities contended that there was a dangerous liason between the Independent Church and Mau Mau. Consequently, the British authorities had confiscated the churches and had either given them to different congregations or destroyed them. The Independent Church claimed that everything but their churches, such an integral part of the Independence struggle, had been restored at the end of colonialism. Unfortunately, even though they had potential sites for their new churches, they were unwilling to build except on the old sites. By now, however, the Catholic Church owned the land that the Independent Church was claiming and refused to consider any claim of the Independent Church. Two District Officers

had come and gone without solving the difficult problem; the problem had not troubled the new District Officer before he left on vacation but, when he returned, four new churches were built on the old sites. To avoid claims of vandalism, the District Officer carefully pulled down these new buildings on the old sites and transported the materials to the sites to which the Independent Church had been allocated. The elders of the Independent Church were indignant when they realised that their attempt to present the administration with a fait accompli was a failure. Avoiding all bureaucratic bottlenecks, they sought a personal meeting with Kenyatta to present their case; a meeting was arranged the following day. The particular District Officer, the District Commissioner and the Provincial Commissioner were summoned to the same meeting where Kenyatta decided on the perfect compromise ... two churches could remain on the old sites and two would be built on the new sites. The incident was finally closed, but not before the older group of leaders had again demonstrated their authority, power and strong relationship with the centre of government power.

Harambee, or self-help, projects are often stressed as key opportunities for development in Kenya. When grass-root politics were discussed earlier, the expression self-help occurred frequently. Owino-Ombudo discusses the nature of these projects, arguing that

> "...(the) call for Harambee epitomises the spirit of National unity and hard work in the task of nation building... This cooperation should have a true and a magnanimous identity. It should seek to start constructive elements in our society. Hence the Harambee schools, colleges and hospitals". (1972,3)

In Gakarara, both the local teachers and the government administration are keen to encourage self-help projects. The interviewees were therefore asked if they had worked on any Harambee project in the last year. Their answers are detailed in Table 3.12. There is obviously a high degree of participation in these schemes but what is more revealing is the type of scheme in which these workers are involved. Table 3.13 demonstrates the participation in specific schemes.

The two major projects completed in the last year were the primary school and the cattle dip. What is important to realise about these schemes is that they were organised and implemented by the local administration, indicating the degree of central control in local development. These development projects were not brief affairs; more than 30 per cent of the population worked on one scheme for three months. This active and lengthy participation is orientated towards establishing a broad infrastructure, schools and farming, for rural development. Before 1970, the population of Kandara had successfully completed numerous Harambee projects including 124 nursery schools, 68 primary schools, eight health clinics and 29 cattle dips. A new Harambee water scheme is in progress which will cover the whole of Kandara division; this is the largest in Kenya's history and has caused much heart searching at the highest levels of the development planning administration. When it is completed, it will provide a population of 167,320 with a supply of piped water through communal points spread throughout the 200

TABLE 3.12

Those Who Worked On Harambee Projects

Reply	Percentages
Yes	50.33
No	59.00
No Reply	0.66

(n = 300)

TABLE 3.13

Typology of Harambee Schemes

Type	Percentage
Several Schools	13.91
Primary Schools	35.76
Nursery Schools	1.33
Secondary Schools	3.33
Cattle Dip	38.41
Roads	1.99
Water Pipes	1.99
Bridge	0.66
Other	1.99
No Reply	0.66

(n = 151)

square miles of Kandara division. The project was costed by the Water Development Department of the Kenyan Government at an approximate cost of £K 500,000 but the present estimate suggests that this figure may be doubled. The population will have to raise Sh K 1,000,000 in cash through self-help efforts and an additional Sh K 1,000,000 by way of materials, transport and labour. Carruthers has argued that any kind of water development is perceived as important for agricultural development and personal welfare (1972). Certainly, present facilities in this area are inadequate and slow public activity has encouraged piecemeal development in self-help water schemes. To avoid such development, the government allocated £K 5.3 million to water schemes, but only £K 1.7 million was budgeted for water development. With such a small amount allocated to water development, it is disturbing that more than 33 per cent should be allocated to one scheme, in Kandara.

At the moment, Gakarara obtains its water from the Thugi and Ruchu rivers but this water is not adequate. It contains much soil in solution and thus appears dirty; animals drink and excrete in the main channel and many women wash their clothes in it. The only source of pure water is a temporary spring. Women and children collect water at the streams and carry it back to the farms, a round journey that can take over one hour. At one time there was an hydraulic system that pumped water to the school but this has ceased to function; this system, moreover did not improve the quality of the water. An attempt to

determine why the population of Gakarara wanted the Kandara water scheme was made. Their answers are tabulated in Table 3.14. What is most important to note is that most people stress the necessity of saving labour; as few people can carry more than 5 gallons at a time, this is not surprising.

The Kandara water scheme is the epitome of a political development project encouraged by a member of Parliament. Leys, commenting on the nature of this relationship between the politicians and the peasantry notes:

> "... what does stand out in the performance of the Kanu leadership and the relations of the party to the electorate is its ambivalent, hybrid quality, combining the frank and official pursuit of private gain on the part of the leaders and with a good deal of sensitivity to peasant demands". (1972,21)

This sensitivity encouraged the present MP to stand for office and achieve election in 1969. Leys indicates that the 1969 elections, which were held so that the President and Parliament could claim that they derived their authority from the peasantry, resulted in the defeat of over half the former MPs who stood again and produced a parliament with a clearly renewed conscience of peasant grievances. The MP for Kandara had offered the water scheme to his constituents, so much so that when the villagers of Gakarara were asked from whom they had heard about the scheme, the results tabulated in Table 3.15 were obtained.

This table is a good illustration of the fact that politicians do perceive peasant demands and that there is

TABLE 3.14

Reasons for Wanting the Kandara Water Scheme

Reasons	Percentage
Save Time	1.66
Save Labour	86.33
More Healthy	10.66
Other	0.66
No Reply	0.66

(n = 300)

TABLE 3.15

Person from whom they heard about the Kandara Water Scheme

Person	Percentage
MP	96.33
D.O.	1.00
Chief	1.66
Other	0.33
No Reply	0.66

(n = 300)

contact between them; but it also indicates that even self-help projects are under the control of the central bureaucracy. In fact, only 60 per cent of the village's population attended the inaugural meeting of the Kandara scheme.

The experience that this area has of implementing its own Harambee schemes suggests that there is no reason to suppose that the people are apathetic about their own development. What is frightening is the increasing control of the central administration even at grass-roots level.

The interviewees were asked to identify various local political figures. Table 3.16 demonstrates the result of their replies to these questions.

The chief is obviously well-known and is the contact between the national administration and the local population. The Member of Parliament is the most identified person because of the Kandara water scheme but the District Officer is not so well known; this is probably because he is the most senior of the local administration, new to his post and non-Kikuyu. As stated before, Kanu as a party is a defunct institution so it is not surprising that the knowledge of the local Kanu leader was extremely low. A Chi squared test was attempted with the null hypothesis that there is no significant difference between the local political personnel, namely the Chief and the Member of Parliament, and the central administration's more senior personnel, the District Officer and the Kanu leader. This

was rejected at the 0.05 and 0.01 levels of probability indicating that there was a difference between the villagers' perception of the local political personnel and the other officials.

In a similar fashion, examples were taken of the villagers' iconography. Table 3.17 indicates that the level of political knowledge and therefore iconography is extremely high in the village. Again a Chi squared test was attempted utilising the null hypothesis that there is no significant difference between the knowledge of political personnel and events. This was rejected at the 0.05 and 0.01 levels of probability demonstrating that the level of political knowledge and concern is perhaps higher at the national than at the local level.

Two important conclusions are obvious when one considers the political life of Gakarara. First, the superimposition of the central administration in all aspects of village life is clear; this, however, is probably just a particular example of a process observable throughout Kenya. Secondly, one notes the importance of a powerful local élite, delimited by age and religion, which can block even the workings of a central administrative policy.

TABLE 3.16

Identification of Political Personnel

Person	Percentage of Correct Identificatio
Chief	95.00
Kanu Leader	39.66
Member of Parliament	97.33
District Officer	56.33

(n = 300)

TABLE 3.17

Identification of Political Facts

Subject	Percentage of Correct Identification
Date of Independence	95.66
Madaraka Day	93.00
V.P. of Kenya	90.00

(n = 300)

CHAPTER FOUR

LAND IN GAKARARA

Land reform is no longer a fashionable research interest and the problems of development infrastructure have become even more moribund. Even geographers are shifting their alliance from the more traditional sphere of man-land relationships to the more mystical and esoteric study of ecological spatial relationships. Yet Kenyatta himself has repeatedly indicated that Kenyan development cannot possible occur unless the people appreciate the value of the land as a resource and are equally aware of their relationship to it.

> "Our greatest asset is our land ... whatever our plans for the future, they must spring from a resolve to put to maximum production our land however small the acreage we possess" (1964,60).

It is, however, one thing to make political capital out of such considerations but it is radically different to implement these thoughts as effective action. This chapter will attempt to evaluate the success of Kenyan Land Policy, particularly land reform and redistribution, in the light of the experience in Gakarara.

The peasant attachment to land is not a whim, mere prejudice or excessive fantasy; it reflects solid and rational judgements of the requirements for survival which have been nurtured and matured through time as man contends with the vagaries of the environmental conditions. If this attachment to land is culled from such extensive experience than it is improper to judge the land tenure

system in isolation. Among the more predominant variables that demand investigation are the edaphic factors, the man-land ratio, the existing organisational structure, the prevailing institutional and technological conditions, the stage of development and the political goals. Within this extensive framework of information it becomes possible to begin to discuss the question of land reform. No perfect land tenure system exists that infallibly guarantees absolute agricultural effiency but few people concerned with land reform believe in a universal panacea. Instead, impetus is directed to rectify a ubiquitous situation in which peasant communities are the permanent losers because of changes in land distribution patterns or because of heavy and unfair taxation. Land reform is really a dual purpose programme which attempts to ameliorate the situation described above. First, it is a redistributive instrument and secondly it is a vehicle for attempting to achieve increased productivity (Dorner, 1972). Land redistribution as an isolated development programme is unlikely to bear much fruit. The United Nations recognised this when they defined land reform as:

> "... comprising an integrated programme of measures designed to eliminate the obstacles to economic and social development arising out of the defects of the agrarian structure". (1970,16)

It is commonly argued that in peasant societies the land should not only be subject to expropriation but that there must be a procedure which enables the reform to obtain the possession of the land in the shortest possible time (Jeffries, 1971). Two political problems immediately arise:

(i) If the reserves of land available to the original

> landowners are large relative to the expropriated proportion, then these owners will continue to wield important influence and will, in effect, continue to out-compete the reformed and small farm section for the limited resources of credit, technical assistance, marketing facilities, etc.
>
> (Lewis, 1968)

(ii) It is not easy amid the jealousies and opposition aroused by the land reform and the inherent difficulties of change-over, to ensure that the numbers settled correspond to the potential resources of that particular property.

(Jacoby, 1971)

Given these considerations it is not suprising that the reforms are often implemented as development from above; bureaucratic implementation frequently exhibits élitist and paternalistic attitudes that destroy peasant confidence in the administration and handicap development in general. If the family-size farm is taken as the basic economic unit then some central agency must organise on its behalf all the mesoscale activities such as the necessary mechanical operations, irrigation, credit, marketing outlets and so forth. These may be done by private firms, by cooperative action or by some government agency, but it is imperative that there be a framework of centrally organised services. Similarly, some central agency must determine the amount of land that should be redistributed to each settler if an individual system of land tenure is to be adopted. In the first place, the farmer must be able to make an adequate living; this should be defined as an earning capacity

equivalent to that which he would receive in an urban employment. Secondly, the area allocated to the individual farmer must not be more than the peasant farmer and his family can actually cultivate.

Despite the political diatribes concerning Kenyan rural areas and the protestations of the Five Year Plan about the emphasis on agricultural development for the small holder, the situation observable on the ground is somewhat bleak. The land laws of any country are frequently an expression of its social and economic policy and it is, therefore, extremely interesting to examine the Kenyan example in this respect.

The early land registration in Kenya was based on the Torrens system, or alternatively covered by the Indian Transfer of Property Act, 1822. The present situation vis-a-vis the land law is expressed in the following statements:

> "There can be little doubt that a decision has been taken, and is being implemented, to move from customary and to adopt statute law ... the statute that governs the new system, the Registered Land Act, is based furthermore on English concepts of land, in places, English statutes on real property". (McAuslan, 1968,196)

And again,

> "In Kenya, it is fair to say that two (legal) problems, statutory v customary, individual v communal, have been regarded as one and the government is firmly committed to the individual ownership of land as it is to ownership under a statutory system. (McAuslan, 1968, 193)

This situation has given rise to problems which are fourfold: legislation of inheritance, land accumulation, land-use legislation and peasant indebtedness. Inheritance becomes

problematic when the socio-political factors gain an ascendency over the purely economic ones, encouraging a regression of fragmentation and eternal law suits. Similarly, there is a tendency towards large individual holdings through either inheritance or through the market; there is no law against land accumulation as there was between 1944-61, and these larger farms tend to be under-utilised. The first Five Year Plan stated that the Agricultural Act, which related to the actual utilisation of land, would be applied to the former African areas; the application in these areas has been varied and no attempt was made to apply the law to the settlement schemes until recently. Lastly, the problem of peasant indebtedness, which is present in the initial years of the individual land tenure system, can easily lead to a decrease in agricultural production; the sale of land to absolve the debt leaves another landless peasant.

This short review will deal specifically with the conclusion of recent socio-economic studies related to the land in Kenya. In 1967, it was observed that development since land consolidation was not involving the small farmer (Sorrenson, 1967). The recent Tetu study indicated that the smaller farms had not adopted cash generating enterprises; similar observations have been made in Vihigia and Kisii (Roling, 1972). These findings, coupled with the knowledge that the agricultural extension services are skewed in favour of the progressive farmers and that land fragmentation was appearing again, encouraged a further study of the Kenyan land policy and the small scale farmer; these results

are not yet available. The latest available material suggests that there has been much land fragmentation in Central Province since registration but there has been little sympathetic investigation of the phenomenon largely because of the emotive political background against which past land issues have been discussed (Mutiso, 1972). Ominde's study has already been cited, but he emphasised that land fragmentation in Central Province, particularly in Murang'a, was extreme. One interesting conclusion that has been drawn from all this material is that land registration and consolidation served its purpose to some extent in that it enables the farmers to use the land titles as security when borrowing from either the public or private sectors.

In all these studies it is accepted that the small farmer is important for several reasons. First, their holdings constitute an important and substantial amount of the total arable land. Secondly, they are economically viewed as being critical because of their numbers and because they emphasise the very skewed income distribution. Thirdly and finally, the farmers who fail to make their farms viable units sell their land and exacerbate the problems of population pressure, landlessness, rural unemployment and outward migration; very rarely do they re-invest the capital gained from the land. These processes were not entirely unforseen. Swynnerton prophesied that able energetic Africans would be able to acquire more land, and bad, poor farmers less, creating both a landed and a landless class. This was regarded as a normal and expected step in the development of any country.

Before considering the land owners in Gakarara, it is necessary to examine in detail land reform in Kikuyu country.

In the traditional society the mbari or the elementary family held tracts of land into which Kikuyu country was divided. Any married man had rights to the plots of mbari and further control over residential, arable and grazing rights. The plots were transferable if the transaction did not involve the permanent alienation of that land; if permanent alienation was involved then the head of the family would have to obtain the consent of muramati, the administrator of traditional holdings, a practice which reveals the residuary rights of the kinship group (Lambert, 1956). With ownership of the land went responsibility and trusteeship, particularly towards the communal rights exercised in water supplies, paths, market sites and grazing. The social structure was reflected in the system of land tenure wherein the family identified with a particular piece of land; the male descendants, particularly the eldest son, had perpetual rights through time but the women had no legal or moral right except that of usufruct (Kenyatta,1938). Transactions of land were based on ties of friendship and affinity; land was, therefore, a medium through which social ties were expressed. Taylor summarises this situation admirably when he realised the implication of two apparently antagonistic principles constantly in operation - community kinship and the individual rights; it was the genius of the native system that it preserved a stable equilibrium between the two.(Taylor 1969).

Several authors have agreed that there has been an agricultural revolution as a result of the consolidation and redistribution of land in Kikuyu country, but few have realised its limitations. Taylor (1969) stresses that there was not enough land to go round in the original redistribution of land so that it is not surprising that there are apparent shortages at the moment. This situation creates a rural middle class and emphasises the implications of feudalism inherent in this system of land redistribution. Even if the land frontier were constantly open in the form of settlement schemes, it is doubtful if they could absorb the population surplus of this area; the answer must lie in utilising the potential of the Kikuyu plateau itself.

The impression that the Kikuyu landscape makes upon the traveller or scientist is very favourable. After the aridity of the plains, the sight of the flowing ridges and valleys, sporting their green finery, is very moving. What is equally striking is the orderliness of the field system. Their orderliness was emphasised by the land reorganisation but it was also inherent in the traditional pattern of tenure:

> "Each landowner was given access to a road and to water whenever possible and the new holdings tend to run in long narrow strips from the ridge tops to the valley bottom. This ensures that whenever possible each landowner gets a share in the ridge top land, the valley side land and the valley bottom land, as was the custom in the past". (Taylor, 1969, 475)

It was this statement by Taylor that made this researcher attempt to analyse the reasons why the new tenurial system should be based on the same spatial conformation that had presumably existed before fragmentation.

One of the reasons why geographers have not developed any major spatial theory in the last 30 years is that all aspects of macroscopic spatial theory have generally been formulated and accepted by the majority of practitioners. Von Thünen, Weber and Christaller have provided useful starting points to stimulate discussion of the primary, secondary and tertiary sectors respectively. Their spatial formulations have governed much of geographical thought for the last ten years and have played an important role in the so-called quantitative revolution. Most recent spatial discussion has centred around the production of min-max computer model for areal division (Taylor, 1972). An obvious dichotomy exists between the former orientation towards the formulation of spatial theory and the latter orientation towards the solution of spatial problems. Considering that few solutions are sought on the basis of the spatial theory developed, the dichotomy is more absurd. The reason seem to be too little geographic imagination and too many armchair abstractions; theory needs the contact and correction of reality.

Kikuyu land divisions have frequently been described as linear. The same term has been applied to agricultural conditions in Thailand, Borneo and Canada (Demaine and Dixon, 1972). The Kikuyu situation is, however, more interesting in that topographically it is the limiting case. It has already been indicated that the area supports a system of rectilinear slopes and that the soil catena varies down the slopes. More importantly, the roads run along the tops of the slopes and the rivers obviously along the valley

bottoms. Theoretically, therefore, one can consider the surface as topologically flat, constrained on either side by two parallel barriers, the river and the road (Fig. 4.1). The perfect land division is rectangular because of the Euclidean principle that the shortest distance between two straight lines is the perpendicular. The most efficient geometric configuration for 'N' farmers is that of linear land use (Fig 4.2).

Fig. 4.3 examines this situation in more detail where non-perpendicular divisions are introduced. For the rectangle ABEF to be equal in area to the trapezium AXEY then XY must pass through the central point of BF which is called Z. Triangle ZXB and Triangle FZY are similar and, therefore, XB equals FY. Thus,

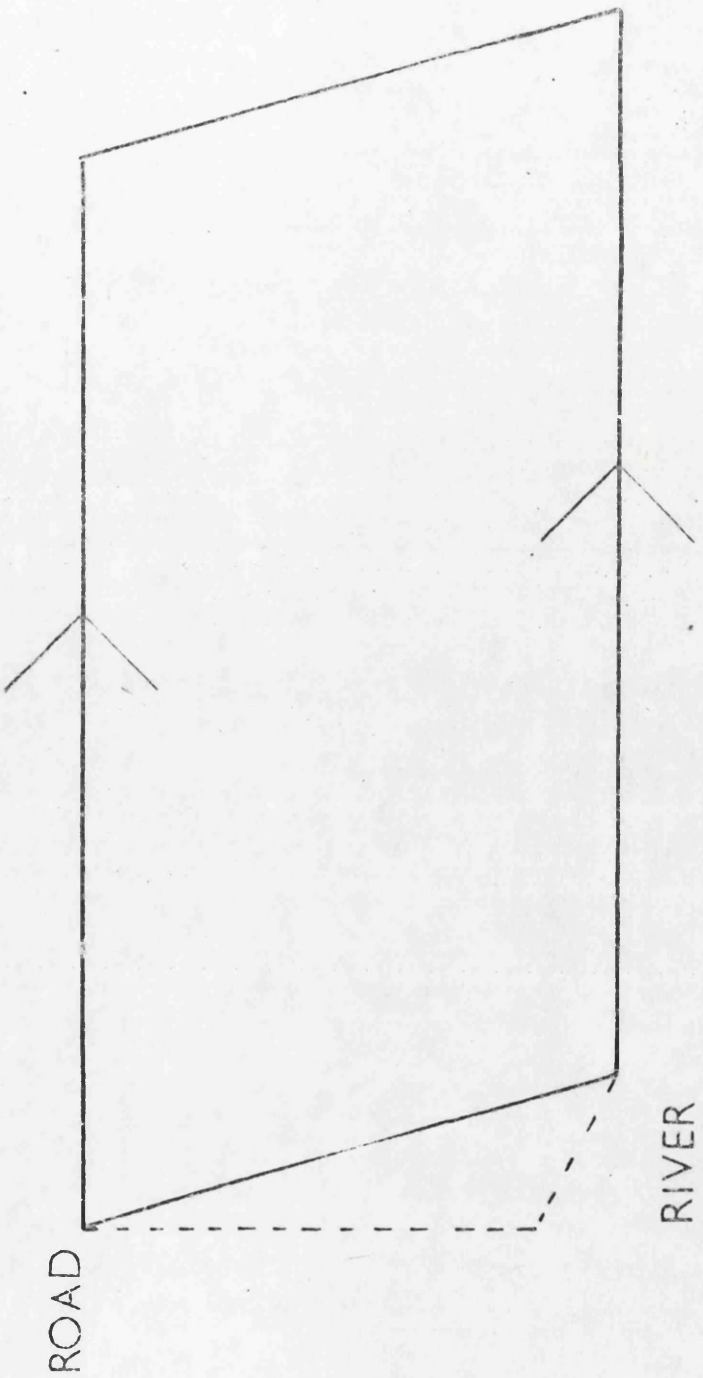
$$AX + EY = AB + EF$$

However, $$XY \rangle BF$$

It is concluded that to gain the greatest equal area for 'N' farmers on a given surface then the division of the land must be rectangular.

Are these theoretical considerations the same as the actual reasons for the linear land use division? Have the true causes of the spatial configuration been determined, or is there some other explanation or more revealing analysis of the land divisions? Several authors have emphasised the accuracy of the peasants' perception of the ecological differences and the consequent varying farming potential in this area are recognised by the farmers themselves. In

Fig 4.1



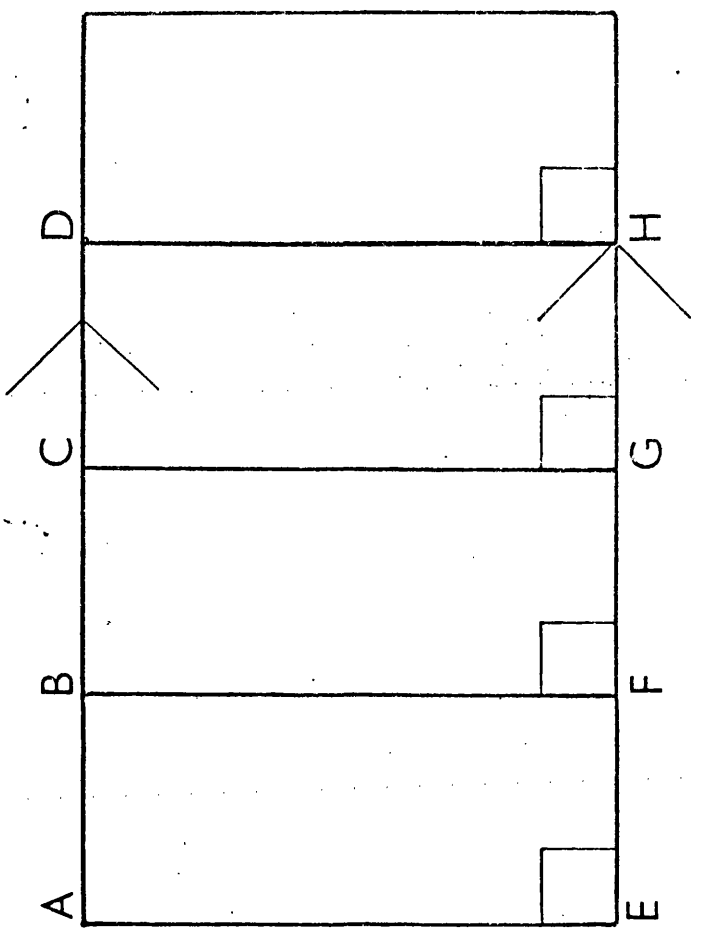


FIG 4.2

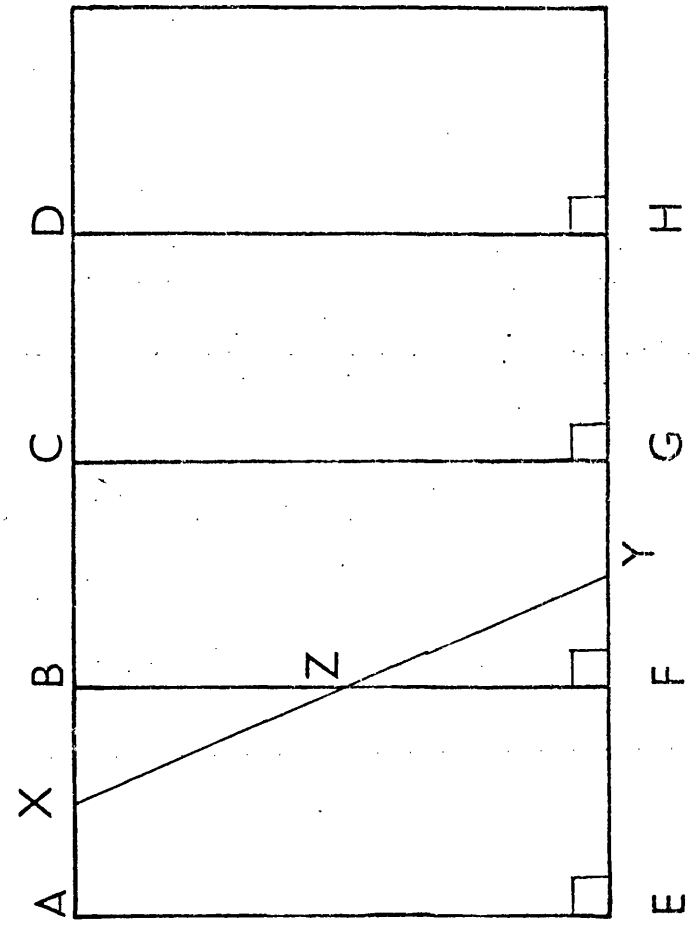


FIG 4.3

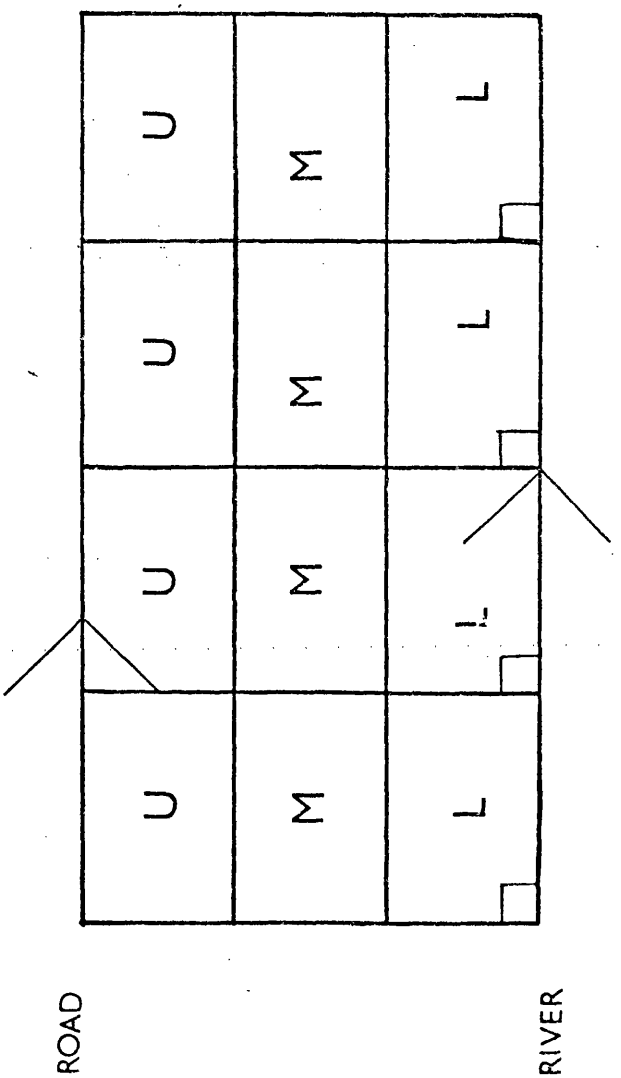


FIG 4.4

the sections dealing with the pedology of Gakarara, it was obvious that there was variation of soil conditions over the rectilinear slope particularly in terms of deviation from the overall mean. The Swynnerton plan recognised the inherent physiographic difference when it suggested that a minimum standard layout should be adopted on all farms. The farmer was advised to grow food crops on the slopes of less than 20 degrees, cash crops on slopes between 20 and 35 degrees and trees and permanent grass on slopes greater than 35 degrees (quoted in Taylor, 1969, 477). In fact, the peasant farmers sought to develop most intensively the valley bottoms where there was little slope and where there was soil accumulation rather than erosion; it is the only site in Kikuyuland where sugar cane can be grown, from which the local beer is produced; it is therefore highly valued. It can be argued that the farmers are competing for the land on the valley bottom and so the rectangular divisions appear; quite simply, everyone wants the valley bottom land and then whatever is available (Fig. 4.4). The road along the top of the ridge and, to a lesser extent, the river boundary, both lose their apparent importance as theoretical considerations. The reality of Kikuyuland reaffirms their value as actual geometric constraints.

Two other factors should be mentioned before we close this theoretical discussion. First, this outline presupposes individual rights in land tenure. Secondly, there must be a substantial population in the survey area so that all the available agricultural land is demarcated

and utilised.

Such debate does not aid administration which has already recognised the importance of linear land divisions and who wish to determine how efficient a particular land division may be. It is possible to formulate simple scales by which this variation may be evaluated. The first spatial variation is indicated by Fig. 4.5 where none of the divisions is rectangular.

If,

T_i is a division on a parallel side,
B_i is a division on the other parallel side,
H is the height between the two parallel sides,
N is the number of land divisions.

$$\Sigma \text{Area ABCD} = \frac{(\Sigma T) + (\Sigma B)}{2} \times \frac{\Sigma H}{N + 1}$$

Then,

$$\frac{2\Sigma \text{Area ABCD}}{\Sigma T + \Sigma B} = \frac{\Sigma H}{N + 1}$$

Therefore,

$$\frac{2(N + 1)\Sigma \text{Area ABCD}}{\Sigma T + \Sigma B} = H$$

As,

$\frac{\Sigma Ht}{\Sigma Hm}$ = I in the perpendicular case, then absolute index has been arranged running from 0 - 1.

Ht is the theoretical height and Hm is the actual mean height.

Therefore,

$$\text{Index} = \frac{2(N + 1)\Sigma \text{Area ABCD}}{\Sigma Hm \cdot (\Sigma T + \Sigma B)}$$

An examination of the 1963 land tenure maps indicated that the land divisions of Gakarara calibrated at 0.83, indicating a high degree of efficient land division.

Another interesting variation is that illustrated in Fig. 4.6, where the land division is an enclave. Here a similar scale solution can be found if one sums the number of lines that cut the parallel constraints.

Let,

n1 be the number of lines that cut one parallel line,
n2 be the number of lines that cut the other parallel constraint,
N be the total number of land divisions,

Thus,

$n1 + n2 = 2N$ is a perfect situation

Therefore,

$n1, n2 = N$
$n1 < N$ is imperfect
$n2 < N$ is imperfect
$n1 + n2 \neq 2N$ is imperfect

Thus,

if $n1 + n2 < 2N$,

Then,

$$\frac{n1 + n2}{2N} \leqslant 1$$

The index, therefore, is

$$\frac{n1 - n2}{2N}$$

which again runs from 0 - 1

For each parallel the equation reads,

$$\text{Index} = \sum_{i=1}^{m} \frac{n1}{mN}$$

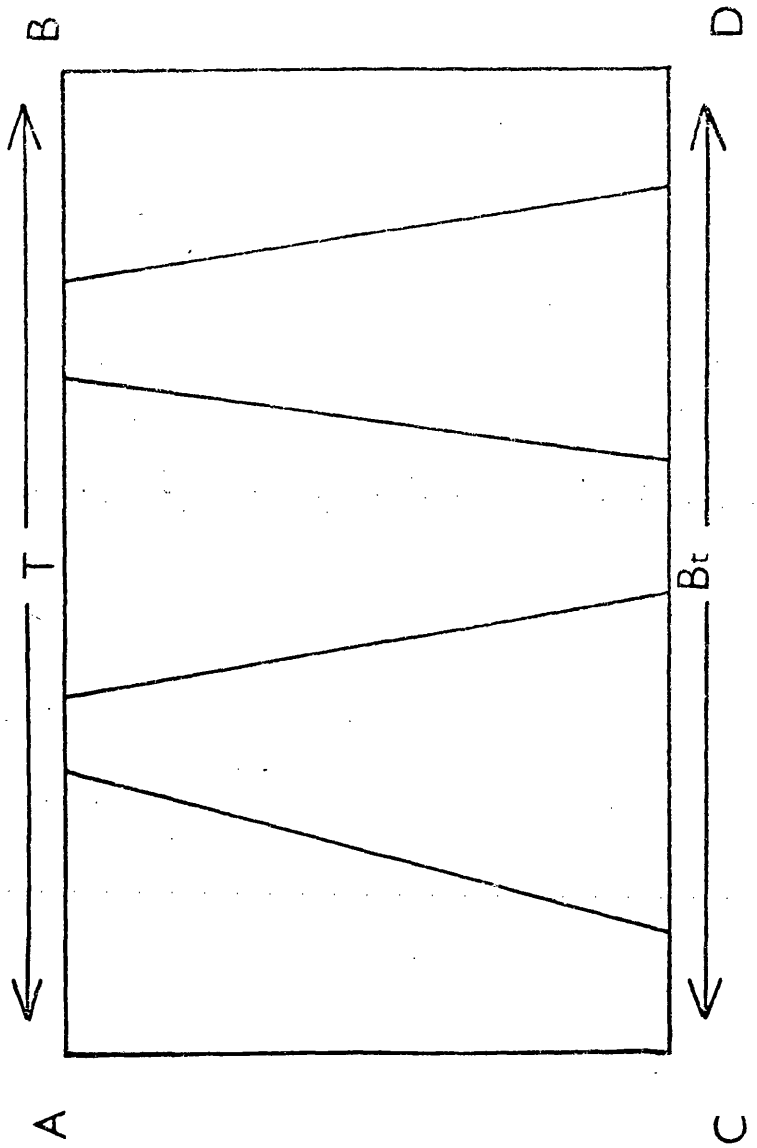


FIG 4.5

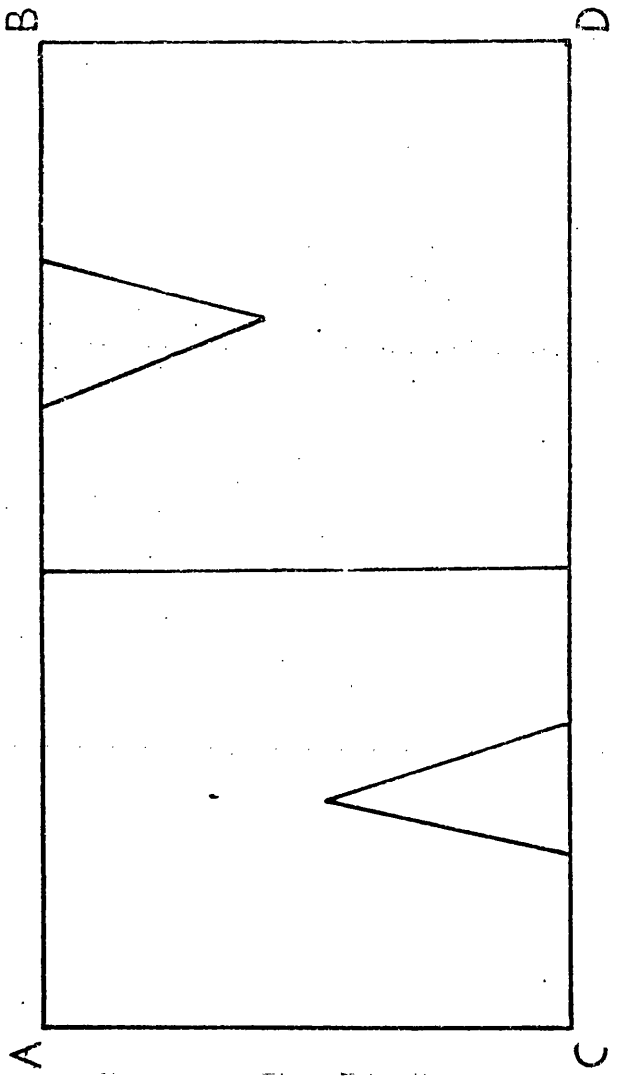
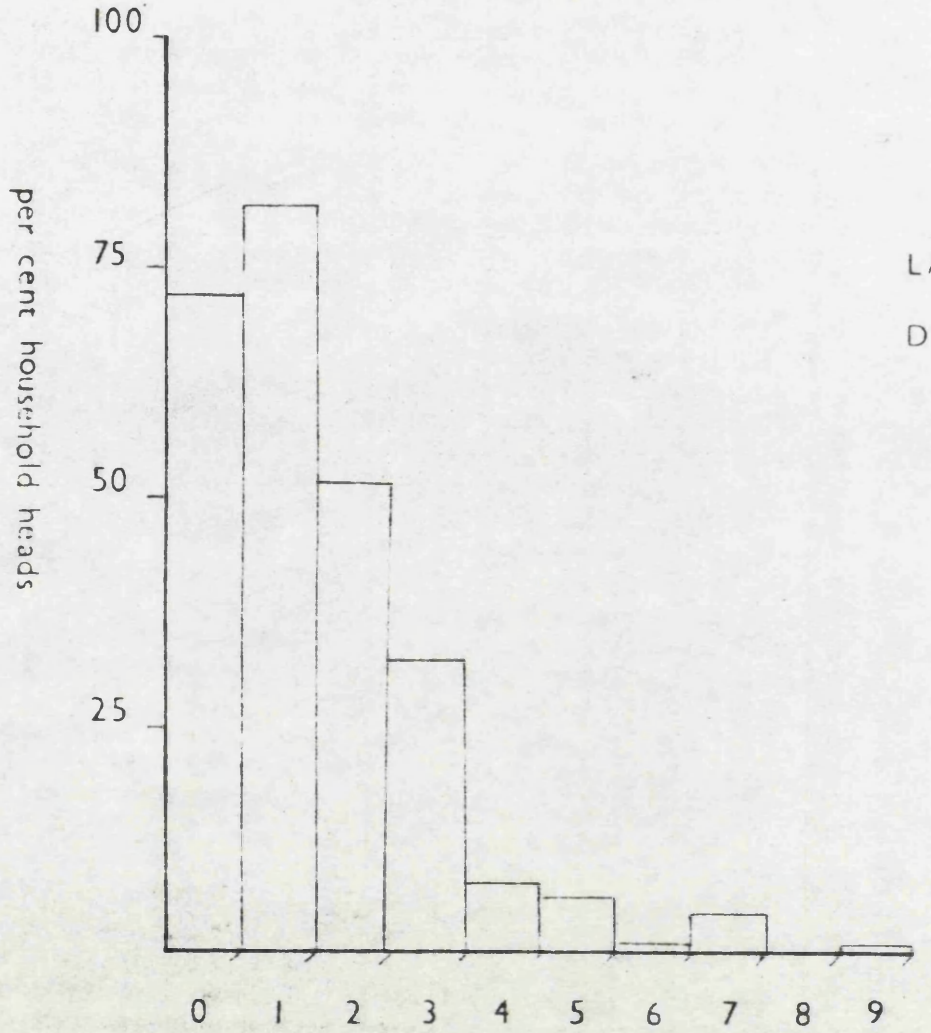


FIG 4.6

The average landholding within the village for the total number of household heads is 1.99 acres; the total area available of agricultural land is 590 acres, or slightly less than one square mile. Forty one of the villagers do not possess land within the village so that the actual holding per farmer averages 2.11 acres. This, of course, indicates only that 16.3 per cent of the population are landless in terms of Gakarara village but this landless section of the population is not necessarily without income or remuneration from either a land holding in a different locality or an occupation within the village community. In essence, therefore, there are only 17 people who may be classified as landless, for many of the workers within the community have land outside the village in their home areas. Again, only 5 out of the 17 households that have no land whatsoever have no source of external income, i.e. 1.6 per cent of the total households in the village have no income whatsoever.

Fig. 4.7 and Table 4.1 indicate the distribution of land according to acreage. It is immediately apparent that this distribution is skewed so that there is an over-emphasis of the population within the smaller landholdings. The mode of the distribution is within the categories 1.1 to 2 acres, a mode that is lower in category than that of the median and the mean which are 2.0 and 2.1 respectively. The median and the interquartile range are shown in Fig. 4.8. Further analysis of the interquartile rage demonstrates that in the lower quartile 62.5 per cent of the new population with less than one acre of land do



LAND

DISTRIBUTION

FIG 4.7

MEDIAN AND INTERQUARTILE RANGE OF

LAND DISTRIBUTION

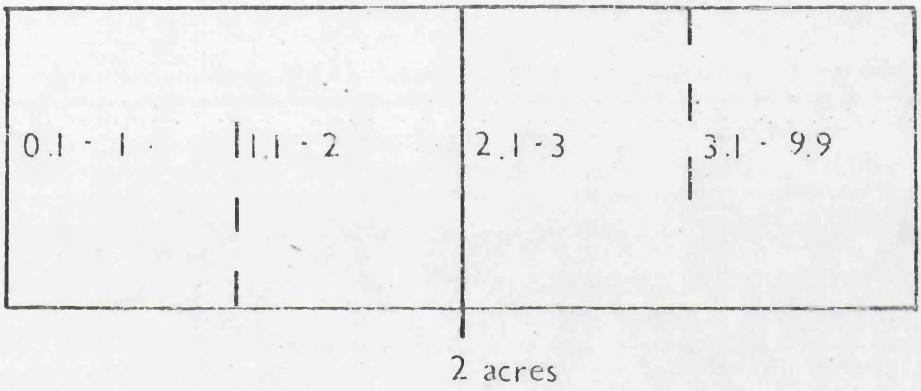


FIG 4.8

not have an external source of income; they only account for 17 of the external occupations. The upper quartile does not produce many farmers who have an income of any sort from employment other than agriculture. It seems unlikely, therefore, that there is any relationship between the farm size and external income within the economy of the village, but this is perhaps a simplistic view of the overall situation; many of the people with an occupation in the monetary sector of the economy buy land as a form of social security but they do not necessarily do this in the form of a single farm unit. Because of their greater mobility, land could be bought as an investment in any part of Kikuyuland.

Two interesting points emerge during the analysis of these figures. First, only one man with more than seven acres has any source of external income. This would suggest a certain threshold level above which there is no need to seek an external source of income. The man who does have this monetary return from outside employment has the largest external income in the whole village, 900 shillings per month, and he is buying all available land as rapidly as he can. The second interesting feature to emerge is that there is, at the other end of the scale, only one who possesses 0.1 acres of land; he obviously finds it necessary to seek an external source of income.

A small section of the farmers possess more than one plot of land within the village. The section is 2.3 per cent of the household heads but this land is severely

fragmented and the individual holdings in all cases was approximately three quarters of an acre (0.75 acres). No one rents land. All are owner occupiers except one young man who gives part of his produce to the owner. Table 4.2 indicates the manner in which the land was acquired. The amount of land that is bought seems, at first glance, to be suprisingly large. In fact, several cross-checks at the Land Registry in Murang'a demonstrated that 72 per cent of the farmers sold their land and bought other pieces between the years 1963-66; this obviously means that the farmers were using their land holding as an asset against which they could acquire cash for investment in their child's education etc.

A total of 61 persons own land outside the village. Nine have two plots outside the village, four have three plots, but the rest possess only a single unit. None of the larger land owners within the village holds land elsewhere, which seems to strengthen the contention that there is a certain threshold level, around the six-acre mark, which, once attained, encourages the farmer to seek neither more land nor an occupation to increase his income. The range of land ownership within the village for the people who own land outside is from 0.5 to 4.0 acres. Thirty one of these sixty one farmers have urban occupations, but this does not suggest a very strong relationship between income and the amount of land owned outside the village. The probable explanation is that much of this land is inherited from the father who now lives in a different part of Kikuyuland or that a second wife lives and works it.

TABLE 4.1

PERCENTAGE DISTRIBUTION OF LAND BY SIZE

Acreage	Percentage of Household Heads	Accumulative Percent
0.1 - 1.0	27.8	27.8
1.1 - 2.0	32.0	59.8
2.1 - 3.0	20.1	79.9
3.1 - 4.0	11.6	91.5
4.1 - 5.0	3.5	95.0
5.1 - 6.0	2.3	97.3
6.1 - 7.0	0.4	97.7
7.1 - 8.0	1.9	99.6
8.1 - 9.0	0.0	99.6
9.1 -10.0	0.4	100.0

(n = 259)

TABLE 4.2

MANNER OF ACQUISITION OF LAND

Manner	Per Cent of Landowners
Bought	58.7
Inherited	40.5
No Reply	0.8

(n = 259)

In any case, it would seem that the reason for the ownership of land outside the village is a familial rather than a monetary one.

The household heads were asked to indentify the quality of their land and the results are detailed below in table 4.3. The features which govern their appreciation of the land are not edaphic but rather topographical. It was obvious from conversation with the peasant farmers that most of them think the soil conditions to be fairly uniform, although they were aware that the soil fertility varies down the slopes of the valleys. The major factors that cited for the land that they considered as good are:

a. access to the wider valley bottoms,

b. terracing on the hillside,

c. the absence of extrusive bluffs.

These factors are the obvious determinants of better agriculture and, along with the land distribution theory mentioned earlier, these considerations go far to indicate the rationality of peasant agriculture.

Three land use transects were attempted during the physical survey of Gakarara; the results of these transects are detailed in Table 4.4. It is immediately obvious that the staple crop is maize, but it is worth noting the amount of maize, 21.2 per cent, that is not interplanted. This farming practice leads to rapid soil erosion. Potatoes and cabbage are a relatively recent crop and are not yet staple requirements. The Swynnerton Plan proposals mentioned earlier concerning the location of certain

TABLE 4.3

FARMER PERCEPTION OF THE QUALITY OF LAND

Quality	Per Centage of Landowners
Good	14.3
Mediocre	46.7
Poor	17.4
Don't Know	21.6

(n = 259)

TABLE 4.4

Percentage Agricultural Land Devoted to Each Particular Crop

Land Transect Data, September 1973

Crop	Percentage Agricultural Land
Maize	21.2
Maize with Beans	28.3
Potatoes	3.6
Cabbage	0.8
Cassava	4.3
Bananas	4.2
Coffee	16.7
Wattle	11.6
Grass	1.2
Other	8.0

activities on specific slope angles do not seem to occur except in the location of the wattle on the valley bluffs. The valley sides are well drained and, along with the fertile valley bottoms, are the major crop growing areas. The absence of substantial areas of coffee in this particular village can be attributed first to the slightly adverse ecological conditions but, more importantly, to the lack of available labour to tend the crop.

Several threads of argument are discernible in this chapter. The rationality of the present peasant reaction to the environment is clear. However, this rational reaction is curtailed by the influence of the political machinery, both past and present, of the Kenyan Government. The work of Swynnerton Plan, under the colonial regime, has largely been anulled. The consolidation of fragments and the consequent security of tenure have encouraged the farmers to use their land holdings as a direct source of cash income; with the minimal size of the holdings, any sale of land is detrimental to the economy of the village. The policies of the national government can be seen to have encouraged a decline in peasant agricultural standards, an increase in land fragmentation and a consequent drift to the towns. Despite the large number of tiny small-holdings, it is apparent that if each peasant were allocated a holding of six acres - a holding that would provide him and his family with the equivalent of an urban wage and, at the same time, would not be too large a unit to be farmed as a family concern - then the peasant farmers would rapidly become a more viable section of the Kenyan economy.

10. Local drinking supply which comes from a spring. This area is also used as a washing area and a watering point for cattle.

11. Self-help water scheme running parallel to the River Thugi. After initial difficulties the local authorities provided pipes to run the length of the channel.

12. View across the Thugi Valley showing good coffee plants in the foreground and a poor maize crop with isolated stands of coffee in the background.

13. View of the good coffee crop from the other side of the Thugi Valley. (cf. Photo 12) Note the systematic terracing which indicates the steepness of the slopes. Unless the coffee plants are adequately spaced, the yield is low; if the plants are adequately spaced and there is no terracing, then excessive soil erosion occurs.

14. View of the Ruchu Valley. The complexity of landuse is well illustrated.

15. Another view of the Thugi Valley. Note the distinct linear land divisions and the location of residences on each piece of land. The actual location of the houses is at the road or the summit of the valley slopes.

CHAPTER FIVE

VILLAGE AGRICULTURE

Kenya is predominantly an agricultural nation with monetary and non-monetary agriculture and with ranching accounting for one third of the GDP in 1969. By the end of the second Five-Year Plan, it is expected that the share of this sector will be 29 per cent. With active government support, peasants are now growing cash crops which are initially limited to plantation production. Coffee production, for example, has passed into the hands of the small-scale farmer but the quota agreements accepted by the International Coffee Agreements, 1962, have been prohibited acreage expansion. Tables 5.1 and 5.2 demonstrate the importance of the agricultural sector to the economy of Kenya and the importance of coffee to the agricultural sector respectively (Africa, 1973).

The current euphoria which has followed the successful recovery of Kenyan agriculture, after the drought of 1971, is not realistic. The production revival and the international boom in commodity prices resulted in the highest ever recorded annual rate of growth, 24.7 per cent, and this transformed the low cumulative growth rates in the 1964-72 period into a respectable 6.5 per cent at constant prices. Smallholders continue to contribute well over 50 per cent of monetary agricultural GDP and they are obviously responsible for all the non-monetary

TABLE 5.1

INDUSTRIAL PRODUCT OF GDP AT FACTOR COST

1971

Sector	£K million	% of Total
Agriculture and Livestock	167.9	32.7
Fishing	1.1	0.2
Forestry	5.9	1.1
Mining and Quarrying	2.7	0.5
Building and Construction	20.8	4.1
Manufacturing	59.5	11.6
Utilities	10.6	2.1
Transport, storage and communication	43.9	8.6
Commerce	51.0	9.9
Ownership of dwellings	22.8	4.4
Government	79.6	15.3
Other Services	47.6	9.3
GDP at Factor Cost	513.4	100.0

Source: Economic Survey 1972

TABLE 5.2

FARM PRODUCTION FOR SALE

(1,000 tons unless otherwise stated)

Crop	Amount	Value, 1971, £K million
Coffee	59.5	18.6
Tea	36.9	10.9
Sisal	44.8	1.7
Pyrethrum extract	0.14	2.4
Maize	256.6	4.2
Wheat	205.6	4.6
Cattle slaughtered (1,000 head)	209.9	13.3
Milk production	229.5	9.3

Source: Economic Survey, 1972

output which is still 15-30 per cent higher than the monetary sector of agriculture. Wage employment in numbers is estimated to be 80 per cent higher on the small holdings than on the large farms; 343,000 are estimated to be employed on the small holdings. There is a danger, however, that the short-run success of smallholder agriculture will divert attention from the long-run problems (Africa Magazine, 1973, 9). The major national problems which are relevant to this study are threefold. First, although the coffee prices are recently high, it will prove difficult to keep world production at reasonable levels. The relatively long gestation period for coffee means that the world market will try to control the creation of excess capacity perhaps, eventually, at the expense of the Kenyan smallholder. Secondly, the system of marketing crucial food supplies, such as maize and milk, requires reorganization at national level; a general deterioration in performance of some of the major marketing organizations would have serious implications for the peasant farmer. Finally, land policy seems increasingly to be a non-existent consideration: with the ending of the land settlement programme, no serious alternative policy has been suggested to increase agricultural output, or to alleviate the income disparities.

Colonial agrarian policy towards the indigenous peasants was largely focused on regions of so-called high potential which lay above the 4,000 feet contour line. Clayton (1964) outlines four major policy directions that were followed during this period.

(1) The administration sought to increase production by introducing better husbandry techniques, new seed varieties and extending the area of cultivable land; these measures were only applied on a small scale.

(2) Because of the population growth and the consequent pressure of land in the native reserves, a form of mechanical control against soil erosion was introduced.

(3) The major steps in the immediate post World War II period were again concerned with the control of soil erosion, but other measures, such as the introduction of cooperatives, incentive and settlement schemes etc. expanded the programme. All failed.

(4) The Swynnerton era of land consolidation and farm planning; these measures recognised that the control of soil erosion per se was a palliative and not a cure for the predicament of the peasant farmer.

All this policy was designed for the area that has become known as Kikuyuland; the last measures were specifically designed and implemented in the Kikuyu areas.

Against the background of the present agricultural situation in the country and with the knowledge of colonial attempts to better the agrarian structure of the peasant economy, it is profitable to consider the nature of peasant agriculture itself. In the traditional economy of the Kikuyu farmer both seasonal and perennial crops played a

major role: millet, sorghum and, lately, maize are the chief seasonal crops with the addition of various types of beans; bananas, sweet potatoes and yams were the most important perennials. Sheep and goats were also extremely important in the traditional Kikuyu economy as a source of meat and clothing but, more fundamentally, they fulfilled various social functions. Cattle are a relatively recent innovation but they have become a matter of great pride and an indication of wealth, (Fisher, 1955). At the present moment maize is the most important staple crop in the area, but the recent introduction of the English potato and cabbage(which are known as 'metric food' because they were introduced at the same time as the metric system) are increasing in importance. The traditional division of labour, wherein the men were responsible for the cattle and for the breaking down of virgin land and the women were responsible for most of the remaining tasks, is meaningless today; there is little grazing available and the land frontier is closed so that the traditional concept of male responsibility needs redefining. Cultivation by hand is still the predominant method of cultivation.

The field agricultural survey results from Gakarara are detailed below.

The staple crop for the village is maize. Overall, the mean area for the 300 households is 1.3 acres. 13.7 per cent, however, do not possess any land, so obviously the mean acreage of maize per household is somewhat higher. Table 5.3 and Fig. 5.1 provide graphic illustration of these

figures. Clearly, every farmer, i.e. every person who has land within the village, grows maize to a greater or lesser extent. The median, indicated in Fig. 5.1, is 1.2 acres and the mode is 1.0 acre; these figures are consistent irrespective of the inclusion or the exclusion of the non-farming population. The emphasis that the population places on maize as a staple crop can be appreciated if it is remembered that the average land holding is less than 2.0 acres and that, from each holding, an average 0.2 acres is taken as public land.

Only two farmers out of the 259 sample grow millet. These are small farmers owning 1.0 and 0.7 acres of land respectively; they are older men and prefer the more traditional Kikuyu food. Their aversion to 'metric food', potatoes and cabbage, is even stronger than their aversion to maize.

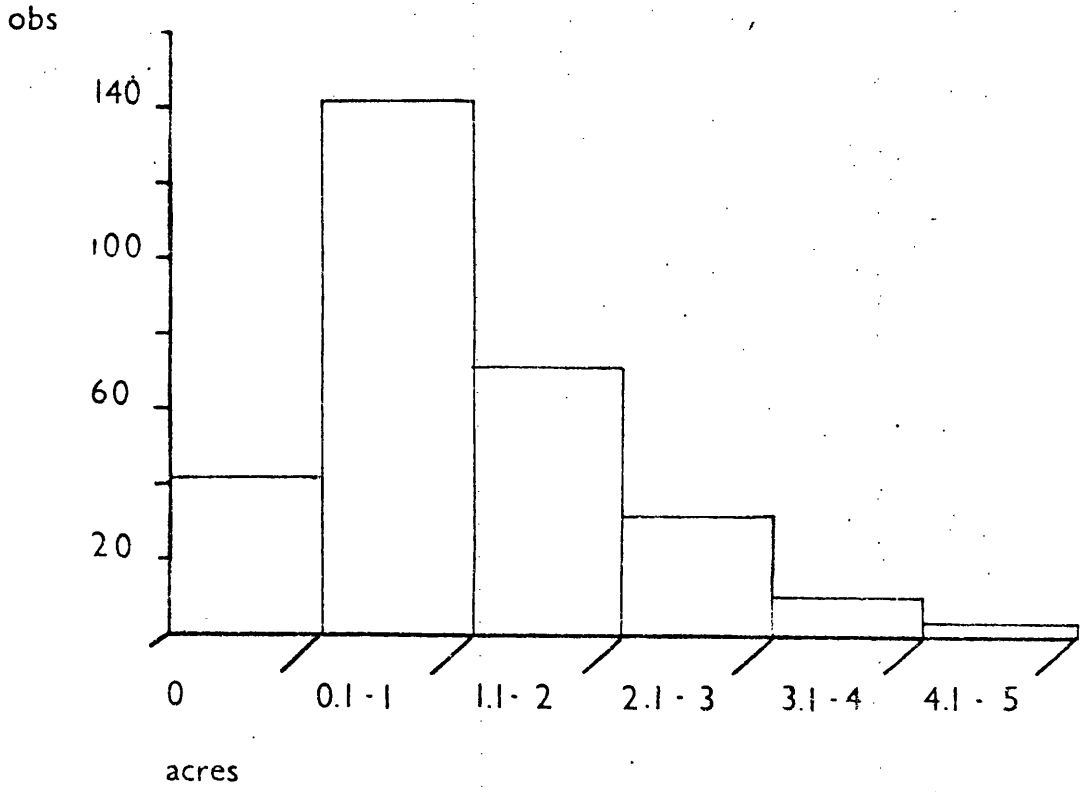
Beans are recognised as being important as a source of protein. As with maize, all farmers grow them, thus stressing the nature of the basic Kikuyu diet, maize and beans. Table 5.4 indicates the percentage of land devoted to beans by individual farmers. One interesting observation emerging from these data is that all the farmers with more than 0.5 acres of beans possess large holdings. In fact, the average acreage for this data subset is 4.5 acres emphasising that the larger land owners are willing to invest in a subsistence crop where demand is always consistent even if profits are low rather than to invest in a cash crop, particularly coffee, where the market price and level

TABLE 5.3

MAIZE GROWERS IN GAKARARA

Acreage	Number	% of Households	% of Farmers
0	41	13.7	0.0
0.1-0.5	66	22.0	25.5
0.6-1.0	77	25.7	29.7
1.1-2.0	71	23.7	27.4
2.1-3.0	31	10.3	12.0
3.1-5.0	10	3.3	3.9
5.1 +	4	1.3	1.5
		(n = 300)	(n = 259)

MAIZE GROWING



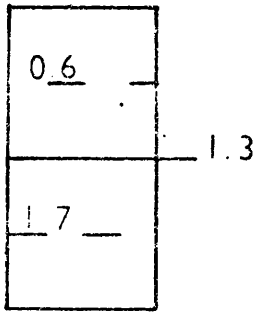


FIG 5.1

TABLE 5.4

BEAN GROWERS IN GAKARARA

Acreage	Number	Percentage of Farmers
Small broadcast	45	17.4
Less than 0.5 acres	204	78.7
0.5 - 1.0	9	3.5
1.1 - 2.0	0	0.0
2.1 - 3.0	1	0.4

(n = 259)

of demand are constantly fluctuating. The majority, however, do not have large enough holdings to grow a large acreage of beans; this explains the predominance of the second grouping, less than 0.5 acres.

Sweet potatoes are commonly observed to be growing on most of the farms, but few farmers claim to plant them deliberately. In total, only five of the respondents claim that they grow sweet potatoes as a deliberate policy decision and neither the size of the farm, their age nor their experience give any indication why they should wish to do so. Generally, though, little systematic care seems to be taken in the production of the sweet potato crop.

English potatoes are grown much more extensively. Table 5.5 presents the extent of the English potato production. This crop is a relatively recent introduction and its adoption has not been remarkable. Two reasons can be suggested for this, namely that the population appreciates the diseases which afflict the maize, particularly rusting, but their knowledge of the diseases that affect the potato crop is slight. Secondly, the adoption of the potato as a staple food implies a radical change in dietary habits; at the present moment, the people of Gakarara seem to prefer to continue with their staple diet of maize and beans. It is impossible on such small holdings to successfully produce both maize and potatoes as staple crops because both make heavy demands on the soil; other produce may be planted or interplanted with either crop but, as with coffee, the maize crop and potato crop must be considered

TABLE 5.5

ENGLISH POTATO GROWERS IN GAKARARA

Acreage	Number of Farmers	Percentage of Farmers
0	161	62.16
0.1-0.5	87	33.59
0.6-1.0	10	3.86
1.1-2.0	1	0.39

(n = 259)

as alternatives, not complementaries. Again, those who grow more than 0.5 acres of potatoes are the larger land owners with an average land holding of 4.6 acres.

Coffee, as previously indicated, is the major cash crop of the area, but for a variety of reasons, the yield in the village is declining. Briefly, to restate the earlier argument, the demographic situation contains such an imbalance that there is not the time or labour available to produce coffee. Maize is the most profitable alternative to coffee because the latter requires so much more labour than maize, a 4:1 ratio. The value of the gross output of maize is, therefore, not a full measure of the opportunity costs of coffee. Also, this area straddles the ecological zones of the tea and coffee small holdings, too low for the former and too high for the latter.

Only 15.8 per cent of the farmers grow coffee and the average acreage devoted to the crop is 3.5 acres; these farmers, in essence, are the élite in the land owners and are enabled, by the size of their holdings, to plant coffee as a cash crop. Table 5.6 shows the extent of coffee cultivation in the village.

All farmers claim that they grow a mixture of bananas, arrowroot and cabbage but, as the land-use transects indicate, many other forms of produce are available in a sporadic, largely uncontrolled pattern.

The following paragraphs are a detailed analysis of all

the farmers who sold crops. In such a welter of indices, one important variable is outstanding. If a farmer owns a large acreage, then he is more likely to sell part of his produce. Table 5.7 describes the percentage of the crop that is sold and the attributes of the sellers. One can readily appreciate that only a small proportion of the farmers, a minority of 16 per cent, actually sell any of their produce. Over 60 per cent of the farmers who actually sell anything sell less than 20 per cent of their total output. Undoubtedly, the importance of the maize crop and the small quantity of produce sold, indicate that the village is still largely a subsistence community and that agriculture is not the primary source of investment in the monetary economy. What is more interesting is that the percentage of the crop sold generally increases with an increase in the acreage of the holding. The exceptions to this situation are bracketed in Table 5.7 but these can be explained as:

(i) individual measurements that do not register true means,

(ii) small households,

and (iii) a household head with an external income.

Generally, however, the trend holds true. Even if one considers the overall mean acreage for sellers as opposed to purely subsistence farmers, one appreciates that the former is much larger.

Table 5.8 demonstrates the general agricultural characteristics of the farmers who market a proportion of their crops. One important point that became obvious in

TABLE 5.6

COFFEE CULTIVATION IN GAKARARA

Acreage	Percentage of Coffee Growers
Less than 0.5 acres	17.1
0.6-1.0	22.0
1.1-2.0	12.2
2.1 +	48.7

(n = 41)

TABLE 5.7

ANALYSIS OF THE FARMERS WHO SOLD CROPS

Amount of Crop Sold	No. of Farmers	% Farmers	% Sellers	Average Acreage
10% or less	15	5.8	36.6	2.95
11-20%	11	4.2	26.8	3.96
21-30%	0	0.0	10.0	0.0
31-40%	5	2.0	12.2	4.26
41-50%	1	0.4	2.4	(2.4)
51-60%	3	1.6	7.3	5.3
61-70%	2	0.8	4.9	(2.65)
71-80%	1	0.4	2.4	(2.40)
81-90%	0	0.0	0.0	0.0
91-100%	3	1.6	7.3	5.1
	(n = 41)	(15.9%)		(3.63)

TABLE 5.8

AGRICULTURAL COMPOSITION OF FARMS WITH CROPS FOR SALE

Amount of Crop Sold	No Coffee	0.5 acres + of Coffee	1.0 acres + of Maize
10% or less	3	2	6
11-20%	3	8	8
21-30%	0	0	0
31-40%	3	2	4
41-50%	1	0	1
51-60%	0	3	2
61-70%	1	1	0
71-80%	0	1	0
81-90%	0	0	0
91-100%	2	0	3
TOTAL:	13	17	24

the field was that coffee, as a cash crop sold to the local cooperative, is perhaps not as important to the local economy as the surplus maize which is sold in Kandara market. For instance, 13 of the 41 farmers who sell part of their produce grow no coffee whatsoever; another 11 grow 0.5 acres of coffee or less; while only 17 farmers grow more than 0.5 acres of the crop. This situation can hardly be described as the foundations of a cash economy based on small holding commercial cropping of coffee. This seems to be an innovation that has been abandoned in this area after the first fruits of the coffee crop were achieved; the germination period required for coffee makes it unlikely that the cash crop will be considered as a short-term solution to the area's problems. The long-term diagnosis is equally dismal (Acland, 1971). Again, if one considers the farmers who sell 91-100 per cent of their crop produce, one realises that the farmers sell mainly maize: two of these farmers have no coffee while the remaining one grows less than 0.5 acres. Their average land holdings, however, are 5.1 acres, so their major investment must have been maize. It is apparent therefore, that these farmers are preferring maize as a cash crop. But a closer scrutiny of the socio-economic characteristics of the farmers who sold crops provides some clues as to why they wish to sell their staple food. Table 5.9 contains the most striking relationship: i.e. over one third of the farmers have external incomes in that the head of the household is registered as permanently employed away from the village; this, however, is a small fraction of those employed outside the village. One can, therefore, suggest that cash

TABLE 5.9

SOCIO-ECONOMIC CHARACTERISTICS OF THE FARMERS WHO SOLD PART OF THEIR CROPS

Amount of Crop Sold	External Income	Mean Family Size	Mean Family Size With External Income	Single Households
10% or less	6	6.7	7.0	0
11-20%	3	5.8	6.6	2
21-30%	0	0.0	0.0	1
31-40%	1	6.6	13.0	0
41-50%	0	2.0	0.0	0
51-60%	1	(8.3)	5.0	1
61-70%	1	5.0	8.0	1
71-80%	1	2.0	2.0	0
81-90%	0	0.0	0.0	0
91-100%	1	3.3	8.0	2
	14	4.96	7.1	

sales of produce could be made to pay debts incurred and registered in the immediate vicinity, namely, Graduated Personal Tax and possible school fees. Considering the average family size of the farmers who sell their crops against the proportion of the crop that they sell, then an inverse relationship is apparent, i.e. the smaller the family, the larger the proportion of the crop that is sold. The mean size of the families who sell crops increases if the household has some form of external income, normally when the household head has outside employment. No strong relationship is apparent between the amount of the crop sold and the number of single householders.

The average return for maize is five shillings per debe; the return for coffee is six shillings per debe because it is a lower quality coffee. Table 5.10 indicates the buyers for each crop; the coffee all goes to the cooperatives and the maize, with one exception, to the Kandara market.

The total figure for cooperative sellers closely reflects the number of farmers who grow more than half an acre of coffee. Kandara coffee cooperative is the centre for these transactions; Kandara market place is the centre for maize transactions but merchants frequently transfer the produce to the close urban areas of Thika and Nairobi.

As already noted, the Kikuyuland area enjoys two harvests per annum. Only seven of the farmers did not plant twice in the preceding agricultural year; Table 5.11 gives the

TABLE 5.10

CROP BUYERS

Buyer	Number of Sellers	Percentage
Cooperative (Coffee)	18	43.9
Local Market (Maize)	21	53.7
Other	1	2.4

TABLE 5.11

ANALYSIS OF THE FARMERS WHO DID NOT PLANT DURING THE LAST HARVEST

Farmer	Outside Employment	Family Size	Land Outside the Village
1	Yes (210/-)	6	Yes
2		5	Yes
3		1	Yes
4		4	Yes
5	Yes (400/-)	8	
6	Yes (700/-)	8	Yes
7		3	Yes

alternative economic sources that were open to them. Three of these farmers had permanent external employment; two of the three received excellent remuneration from their source of external employment. The family size of this particular group were not large; the mean was beneath six persons per family. Most importantly, all except one had another form of agricultural revenue outside the village so that they were not necessarily forced to cultivate their Gakarara plots.

The total acreage planted was 433.8 acres around the October of 1971. This acreage was 72.6 per cent of the available agricultural land. It is, therefore, interesting to note Clayton's comment at this juncture:

> "...the idea that idle land can be economic not only goes against the universal practice of the Kenyan peasant farmer, it contradicts the colonial planned farm scheme. Total arable land is cropped in both seasons. (1964, 96)

If the full utility of available agricultural land is not achieved, a question mark must be raised about the present efficiency of the Kikuyu system of agriculture. These queries can only be answered by attempting to look at the outside controlling influences of the Gakarara economy. There is a mean acreage of planted land and a mean acreage per farmer of 1.7 acres. Below, in Table 5.12, is tabulated the number of farmers who do not fully utilise their land; these calculations exclude the seven farmers mentioned earlier. A staggering total of 59.07 per cent of the farmers do not fully utilise their land. The reasons for this wastage are not difficult to appreciate. First, 50 per cent of the farmers who do not fully utilise the land had external

TABLE 5.12

ANALYSIS OF FARMERS WHO DID NOT FULLY UTILISE THEIR HOLDINGS

Under-Utilisation	% Farmers	Other Land	Outside Employment	+ 2.5 Acres
0.5 acres or less	26.25	27.87	22.5	14.42
+ 0.6 acres	32.82	37.7	27.5	63.46
TOTAL PERCENTAGES:	59.07	65.6	50.0	77.9

sources of employment, reducing their time commitment to the farm but allowing them to buy land as a form of social security. Thus, these farmers account for 65.6 per cent of the land owned outside of the village; similarly, they possess 77.9 per cent of the 104 farms in the village that have an acreage of 2.5 acres or more. In fact, only five of these farmers have other land outside the village, a farm exceeding 2.5 acres within the village and outside employment; but they all under-utilised this land by leaving an average 1.4 acres uncultivated. As rich farmers, they seek only profitable returns on the crops, particularly sugar cane, which they grow on the valley bottoms for their own processing of beer.

Crop damage reduces the agricultural output of the village still further. Table 5.13 provides the details of the type of damage. A small percentage suffer losses through natural hazards, namely flood, drought and insects. In any economy, flood and drought are difficult to predict and control; in subsistence economy insects provide another uncontrollable variable. The most prevalent disease is maize rust. Three farmers claim that wild animals, usually monkeys, spoil their crops; the researcher could not verify these statements. The only total failure in the village was an old widow, who, because of illness, had been unable to plant and gain the benefits of the rains; her total crop was thus ruined by what she termed "drought".

The damage to the crops causes a decrease in the total amount of produce harvested. No exact figures are available

on the actual acreage or amount of produce that is destroyed so that when one considers harvest returns one must not presume that all loss is attributable to crop damage. Several other factors need consideration, such as the family consumption of the subsistence crop before harvest: when food supplies are low, no external income is available and when the harvest is approaching maturity the family will obviously harvest some part of the produce early. Other influences that can account for some loss in the harvest area are the availability of labour and the area deliberately left to allow a little grass to grow as fodder, the few crops that are harvested perennially and the area left to seed.

Table 5.14, however, indicates that the total acreage lost during the harvest is relatively small; figures in this table are in tenths of an acre. The greater number of farmers who say that they do not harvest the total area that they plant also emphasise that the total area lost is under 0.5 acres. When one appreciates that these small losses include the amount lost through crop damage, availability of labour, produce taken before harvest etc., then one realsies the advantages of this particular environment. Only 117 farmers, just over one third, suffered a loss from the area that they had planted. One person, mentioned earlier, suffered a total loss because the planting date was too late. Eight other farmers, for a variety of reasons, also lost the major part of their crop. Overall, however, the villagers viewed the harvest as quite satisfactory.

TABLE 5.13

CROP DAMAGE

Type of Damage	Number of Farmers	Percentage of Farmers
Flood	16	6.18
Drought	16	6.18
Insect	14	5.40
Disease	72	27.80
Other	3	1.16
No Damage	136	52.50
No Reply	1	0.4
Total Failure	1	0.4

(n = 259)

TABLE 5.14

DIFFERENCES PER FARMER BETWEEN AREA PLANTED AND AREA HARVESTED

Area Lost in Acres	Number of Farmers	Percentage of Farmers
0 - 0.09	0	0
0.1 - 0.19	23	19.6
0.2 - 0.29	25	21.4
0.3 - 0.39	7	6.0
0.4 - 0.49	10	8.5
0.5 - 0.99	32	27.4
1.0 - 1.49	15	12.8
1.5 - 1.99	1	0.85
2.0 - 2.49	2	1.7
2.5 +	1	0.85

(n = 117)

The total acreage lost between planting and harvesting was 57.1 acres. This was a mean acreage loss per farmer of 0.48 acres. 39 per cent of the total sample (300) could be said to have lost produce in terms of those actually farming, (259), 45.2 per cent forfeited some produce; some did not farm for that particular harvest so that in practical terms one must conclude that 46.4 per cent of the farmers who planted for the last harvest suffered output losses. In acreage figures, 13.16 per cent of the planted land was affected by these losses or 9.5 per cent of the total land holdings.

The actual agricultural production of this harvest was 1,658 bags; this figure only refers to the coffee and maize produce, the two crops that are calculated in this manner. Usually, six debes, a debe being a five gallon cubic measure, fill one bag. The return per farmer who planted for this harvest was 6.6 bags. In an average harvest, the farmers estimate that the return should be in the order of 2,150 bags which is an average of 8.3 bags per farmer. In other words, the under-utilisation of the agricultural land for this particular season meant that the realised harvest was only 76.8 per cent of the normal yield. This estimation of the peasant farmers is disturbing because it means that, even if one makes the necessary adjustments for variations in climatic conditions, one is still confronted with the knowledge that there is a serious discrepancy between what the farmer thinks he could produce and what he actually produced during this harvest. Climatic conditions cannot be blamed in this instance, however,

for we have already indicated that the actual area planted was far beneath that which could have been utilised and that this is the cause of the low yields. The cause of the under-utilisation itself is the external pull, the centrifugal economic forces, that destroy the social structure and, consequently, the agricultural calendar of the village.

4,322 shillings was the net cash return for the harvest that was sold giving each farmer an average 135 shillings for the produce he sold. All the sellers are landowners with more than 1.5 acres of land. At the time of the survey only 34 sellers had gone to the market with their crops; most of the crop was coffee because few of the peasants had decided at the time of the survey, immediately after the harvest, what quantity of the staple crop was for sale.

It has already been stated that there are only two crops that have a regular market value to the village economy, maize and coffee. The total acreage of maize is three times that of coffee, 390 and 120 acres respectively, but all coffee has to be sold; it is a cash crop unusable as a food to the Gakarara peasants. The return on coffee as a cash crop is low for little of it is planted in a systematic manner. Field data suggest that the return per season on one acre of unterraced, unpruned, untended coffee bushes that are not young is little over 28 shillings. The value of the coffee crop would, therefore, be in the region of 3,500 shillings. It can be concluded that less than 1,000 shillings could have been obtained from the sale

of maize, as was indicated in the last paragraph, but it also indicates the low margin of choice and decision making available to the small peasant producer. If his land is too small, below 1.5 acres as indicated above, then he cannot grow maize and coffee so he chooses to grow maize to support his family; if he chooses to grow maize on such a small holding then he has no cash income; if he has no cash income from the farm then he must seek external employment to meet his expenditures, but then he is removed from the village labour force.

The following section is concerned with the agricultural calendar for the 'Long Rain' season of 1972, the season for which crop production figures were gathered by questionnaire.

Most farmers planted during the middle of March so that the crops would have germinated by the beginning of the 'Long Rain'. Table 5.15 shows that some farmers planted as late as June or even July but these were those who lost most of their produce.

The total number of personnel involved in the planting was 420 persons (See Table 5.16). A substantial proportion of the farms, 62.5 per cent, were planted by only one person; normally, this was the wife of the head of the household. There was a constant correlation between the number of personnel involved in planting and the size of the land holding. This consistency would suggest that each farmer makes a conscious decision whether or not to employ non-family

labour based on such variables as the amount of income generated by external employment, the area of the farm that will be planted and the time available for the planting process. Other factors, such as the health of the women, who do most of the labouring, and debts accrued, which are payable as agricultural labour, are examples of social variables that are virtually impossible to determine in an econometric sense.

Table 5.16 also indicates the number of days the planting operation required; most of the farmers managed to complete the planting in less than two days but these farmers had essentially small acreages tended by more than one person. In other words, assuming that the agricultural acreage per farm unit is constant, there is an inverse relationship between the number of personnel employed and the area to be sown.

Several authors have stressed the importance of the labour input into African peasant societies. Jackson (1972) argues that none of the attempts to apply agricultural land-use theory to Africa is successful because the ethnocentricity of most western scholars encourages them to consider land-use theories on the basis of the optimal return per unit area and not the optimal return per unit of labour. Clayton (1965) considers that, when planning agricultural development in low-income countries, the problem is one of considering labour allocation as the transformation of leisure into goods through the transformation of available labour time agricultural output;

TABLE 5.15

MONTH OF PLANTING

Month	Number of Farmers	Percentage of Farmers
January	0	0.0
February	16	6.2
March	182	70.3
April	52	20.0
May	0	0.0
June	1	0.4
July	1	0.4
August	0	0.0
September	3	1.3
October	4	1.5
November	0	0.0
December	0	0.0

TABLE 5.16

PLANTING WORKLOAD PER INDIVIDUAL FARM UNIT

Workers Per Unit	% Units	Non Family Workers Per Unit	Average Size of Farm Unit
1	62.5	19	2.7
2	20.1	16	4.0
3	13.1	7	2.7
4	1.9	1	8.0
5	1.5	3	2.3
6	0.8	1	8.0

DAYS REQUIRED FOR PLANTING PER FARM UNIT

Number of Days	Farms	% of Farms
Less than 1	109	42.0
2	85	32.8
3	32	12.4
4	14	5.4
5	8	3.1
6	3	1.2
7	6	2.3
8	2	0.8

this argument, however, incorrectly assumes that much leisure time is available to the peasant population (Franklin 1962). In a Kenyan context, Heyer (1971) has examined and developed a linear planning programme analysis to depict the constraints on peasant farming; none of the improvements considered, particularly the land/labour ratios, were substantial enough to "render one optimistic about the future". Against this theoretical background, it is worth more closely reviewing the agricultural labour data.

If one utilises model definitions then a man-day is the amount of work that one man can complete in one day. It is therefore possible to reckon how much land, in acres, was planted in one day by one man. Table 5.16 shows that a total of 418 people work a time period of 428 days; this allows the calculation of persons per day per acre which approximates 0.4 acres per man day. To a western agricultural economist, this indicates a severe under-utilisation of labour, but a different perspective is feasibl

The ethnocentricity of much research attempted in under-developed areas encourages inaccurate and often false research conclusions. Labour output is an obvious example where the principles of time and motion are blatantly inapplicable. No peasant farmer is to be judged solely in terms of quantifiable production per unit of labour because the social system which the peasant operates make demands on his time which are not paralleled in our society. First, he has to allot time to managerial decisions. He is the one who, through communication with his neighbours,

decides upon planting time; he is the one who determines the varying environmental and ecological potential for several possible sites for particular crop combinations; and he is the one who is not merely a labourer. Secondly, the demands of the family ties and the kinship group must be met often in situations which at the time 't' prove detrimental to a player's perceived strategy of environmental manipulation. A related aspect of peasants' existence emphasises the contention that one cannot interpret the data in a western production equation. These aspects can be summarised under the headings of "The Paradox of Peasant Existence". One striking element of this paradox can be considered at this juncture - namely, if the peasant farmer is a good agriculturalist, why is his return per unit area so low? Although Franklin et al. (1965), have attempted explanations which are not environmentally deterministic, the solution to the paradox would seem to lie in the relationship between the peasant and the market economy. These broad considerations are borne out by a closer consideration of the processes operating within the village of Gakarara.

As we have previously emphasised, a substantial proportion of the male population has migrated from the village in search of urban employment. The young married women, therefore, bear the brunt of the agricultural labour but they are also responsible for the upkeep of the home and the rearing of children; it is thus hardly surprising that the labour input seem low even at planting time. However, if one compares the system of highly

complex, sedentary agriculture of the Kikuyu with shifting cultivation where the labour requirement is distinctly low, then the Kikuyu labour input seems high. De Schilippe (1956), in his study of southern Sudan, indicates that the mean maximum of agricultural work by the Azande is only 44 per cent of the total possible effort and the monthly minimum falls as low as 5 per cent. The data for the harvest shows an expected parallel pattern to that of the planting. Most of the farmers harvest in September although a substantial proportion, 30 per cent, harvest a little earlier in August. Table 5.17 indicates the month of harvest; the farmers who harvest in February and March are the farmers who did not plant for the March 1972 season.

The total number of persons involved in planting is 479 persons. At the higher end of the scale, the large land owners who possess eight or more acres employ outside labour. There is, however, a significantly larger figure range of non-family members involved in harvesting. The total number of days required for the harvest is 676 so that the overall required labour input for the harvest is higher in quantitative terms, 0.3 per man day, than that required for planting. The displaced frequency, seven days, is because several factors cannot accurately recall how long the harvest has taken even though it was more recent than the planting. Secondly, the task is less painstaking if all the produce is not collected and stored. Lastly, because the farming is of a subsistence nature, part of the crop has already been consumed.

The agricultural techniques employed by the farmers are essentially those derived from iron-age technology. As peasants with few cooperative practices, they are not able to enjoy the luxury of mechanised production. Moreover, because of the nature of the terrain and the smallness of the individual holdings, no one uses an ox plough. The two implements that are most commonly used in agricultural labour are the panga, a large knife for cutting and clearing bush, and a jembe, a long or short handled hoe.

The pressure on the land does not allow for fallow periods so the regenerative edaphic processes are jeopardised Farmers appreciate this situation and maintain or attempt to maintain the ecological balance by employing both natural and chemical fertiliser. Table 5.19 indicates the number of farmers who utilised fertilisers and the type of fertiliser used. Natural fertiliser is the recycling of the excrement from the animals kept within the compound; chemical fertiliser, however, is obtained through the agricultural extension service. This innovation is directed towards and accepted by the wealthier farmers who obviously have wider options to consider in their decision making process - in fact, except for one farmer, all those who use chemical fertiliser have a source of income from farming as well as an external income. The smallest land owners are those who use no fertiliser and the largest are those who use both natural and chemical fertiliser.

The major feature of the agricultural landscape is the existence of terracing. Terracing has been observed

TABLE 5.17

MONTH OF HARVEST

Month	Number of Farmers	Percentage of Farmers
January	0	0.0
February	2	0.77
March	5	1.93
April	0	0.0
May	0	0.0
June	0	0.0
July	0	0.0
August	73	28.96
September	170	65.64
October	5	1.93
November	0	0.0
December	2	0.77

TABLE 5.13

HARVESTING WORKLOAD PER INDIVIDUAL FARM UNIT

Workers per Unit	% Units	Non-family Workers Per Unit
1	51.7	20
2	21.6	10
3	13.5	10
4	7.7	1
5	3.1	0
6	0.39	0
7	0.39	0
8	0.39	0
9	1.16	3

DAYS REQUIRED FOR HARVESTING PER FARM UNIT

Number of Days	Number of Farms	Percentage of Farms
1	77	29.7
2	73	28.2
3	38	14.7
4	19	7.3
5	13	5.0
6	4	1.5
7	32	12.4
8	0	0.0
9	3	1.2

in several traditional African economies and there are contentions that, as a cultural landscape, it can be correlated with the rise of iron-age technology. The purpose of the terracing, however, was to facilitate irrigation and water retention rather than to prevent soil erosion.

The Kikuyu record in their oral traditions that they have only recently occupied the area between Mount Kenya and the Aberdares. European colonization of the adjacent areas drove the Kikuyu from the European reserves, the White Highlands, into an area which possessed steeper slopes. At this juncture the Kikuyu were unwilling to terrace the slopes and it was not until the early 1930s that there was any appraisal of the dynamic relationship between the nature of the land, the type of husbandry and the increasing population pressure. Not until 1950s was any policy implemented in an attempt to reduce soil erosion; the Swynnerton Plan was aware of the nature of the terrain and soil structure which were vulnerable to gullying because of the periodic but heavy rainfall. The rise of the Mau Mau and the wholesale detention and villagisation of the peasant population allowed the colonial administration to implement a policy of terracing or building with coerced labour; terracing becaame a symbol of imperialist repression. After independence, soil conservation remained anathema because of its political associations. Only the larger farms, particularly those producing coffee, sported terracing but now new processes were observable which were further destroying the soil catena. With the total acceptance

TABLE 5.19

FARMER UTILIZATION OF FERTILIZER

Type	Number of Farmers	Percentage
Natural	46	17.8
Chemical	62	23.9
Both	113	43.6
None	38	14.7

(n = 259)

of maize as a staple diet, the agricultural advisory service had recommended a minimum planting distance of two feet between each maize plant. This recommendation was accurate for the semi-arid areas but it was not conducive of good farming on the steep well-watered slopes of Gakarara village. Furthermore, the refusal of the farmers to interplant the maize with some root crops, such as potatoes and beans, exacerbated the situation. Even if the present local administration which has clearly identified the causes of continuing erosion suggests a suitable conversion scheme, the lack of manpower within the village will prohibit any rapid solution.

Livestock has always been valued highly by the Kikuyu, even though they are a sedentary, arable people. Evidence clearly demonstrates that for festivals, marriages etc., the use of livestock as gifts has long been common practise; this is an indication of the importance attached to livestock. In fact, cattle have an exact value in terms of goats and other animal produce. With the advent of the Europeans, new breeds of cattle were introduced. These cattle allow for the twofold division, grade and native; the former have an average market value of six hundred shillings, the latter of two hundred. In the 300 households that were surveyed there is a total of 58 ~~people~~ and 189 grade and native cattle respectively. Few farmers possess more than one grade cow; cows are valued more highly than beef because they provide both milk and meat. Pasture for the cattle is difficult to obtain except in the area round the secondary school; public land throughout this area is

monopolised by the women's cooperative group with the approval of the local administration.

Goats are more numerous than cattle in Gakarara. Traditionally these animals have been favoured by the Kikuyu; the meat and milk have always been consumed but, more importantly, the animals have a lower subsistence level than that of cattle and so are easier to maintain. This attribute means that goat herds survive in areas such as city streets, intense arable areas and arid environments that would be economically unproductive for any other animal. Against these advantages must be weighed their ability to destroy most environments by overgrazing if there is not an adequate stock control.

The market price for goats varies considerably according to age and condition; the price range, however, seldom exceeds a range between twenty five and seventy shillings. Fifty four shillings is the average price per capita. The animals range freely through the village, eating the stubble and the short grass at the sides of the fields and roads; their apparently insatiable appetite is yet another factor encouraging soil erosion. Table 5.20 indicates the distribution of goat and other animal ownership among the farmers. The distribution of goats parallels that of cattle; few farmers possess more than three head of livestock. The richer farmers with cash crops and external incomes possess the larger herds.

There are over a thousand chickens in the village.

TABLE 5.20

LIVESTOCK POSSESSION PER FARMER

(a) CATTLE

Grade	Native	Animals Per Farmer
26	56	1
5	28	2
2	18	3
1	2	4
2	3	5 +

(b) OTHERS

Goats	Chickens	Animals Per Farmer
44	16	1
51	23	2
35	27	3
11	20	4
7	17	5
7	13	6
4	11	7
4	4	8
1	3	9
0	24	10

Although the flesh of the chicken is eaten there is a general reluctance to consume the eggs, which are regarded as infant food. The average market price for chicken is six shillings, but the range of price is from two to twelve shillings, depending on the age of the birds. One farmer, who distorts the overall picture, owns more than two hundred birds, but although they cannot be classified as battery hens they are contained in a form of hen-run; most other birds are free rangers. A significant proportion of the farmers possess more than ten hens; the average number of birds for this particular group is twenty three hens per farmer, but this number is obviously swollen by the farmer mentioned earlier.

Although the total number of livestock does not seem excessive, their presence decreases the area available for crops. Overgrazing further destroys the already precarious ecological balance. The villagers, however, value livestock highly for, as arable farmers dependent upon seasonal rainfall, it is their only source of readily convertible currency.

Two major themes emerge from this discussion of the agriculture of Gakarara. First, although this area is generally classified as an area of small-holdings devoted to coffee, the major crop is maize. The importance of the maize crop and the small quantities which are sold indicate that the village is practising a largely subsistence economy; agriculture is not the primary investment of the people in a monetary economy. Second, if the land holding

is less than 1.5 acres, then the farmer chooses to plant either maize or coffee; and normally, the individual farmer chooses to plant the subsistence crop, maize, so that he is able to support his family. This decision, however, means that he has no cash crop or income to meet his expenditures. To meet the expenditures, he seeks external employment, withdraws form the village labour force and, thus, further limits the potential agricultural development of Gakarara.

16. Intensive cultivation of the valley bottom. Young banana plants appear in the foreground.

17. Confluence of the Thugi and Ruchu rivers.

18. The Secondary School, Gakarara. This building which formerly housed the local administration is one of the few stone buildings in the area.

CHAPTER SIX

NUTRITIONAL STATUS OF THE COMMUNITY

As the study of Gakarara proceeded, the author became increasingly aware of some complex implications of the population pressurizing system described in the previous chapters. The problems may be summarised as:

1. The high population density of the area.
2. Human adjustment to the situation which tends to take the form of outward migration of adult males in search of wage employment.
3. Further adjustment evidence by the adoption of female adults of piece rate employment offered by the nearby coffee estates.
4. Deterioration of the land quality because
   (i) Poor husbandry is encouraged by the labour drain

and (ii) Refusal to undertake building in a steep-sloped area that experiences heavy rainfall.

5. The small acreage to each family and the division of that acreage upon inheritance.

One of the results of this pressure which can be relatively easily measured and correlated with the rest of the data is the nutritional standard of the population; the consequences of such a pressurising situation is a deterioration in the local diets that puts a disproportionately greater stress on the vulnerable group in the society, especially the old and infirm, pregnant women and children. Wisner (1972) has already analysed

such data in a series of similar studies on familial response to such stress. It was decided that for the purpose of the present survey an assessment of the nutritional status of the children between the ages of 0 - 36 months and a quantitative study of the children's diet would perhaps yield useful indicators of the stress within the community. Furthermore, it was hoped that several farm unit variables would be found to explain the difference between the families having well-nourished and those having poorly-nourished children. Thompson (1973) has provided a logical framework within which to analyse and, therefore, localise a particular nutritional problem. The framework isolates seven basic contributory factors plus birth weight, which may itself be determined by the mother's nutritional status; these seven contributory factors are then further analysed. Figures 6.1 and 6.8 illustrate this analysis. The various divisions have been marked to indicate when problems of community health appear to contain more social, economic, educational or ecological constraints than medical ones. Table 6.4 should indicate the importance of the preceding discussion on agricultural production and land tenure but it is noteworthy that many of the variables outlined in the systematic analysis of nutrition have already been mentioned. At the end of this section some attempt will be made to correlate the importance of independent variables with nutritional status.

FIGURE 6.1

NUTRITION OF CHILDREN

UNDER THREE

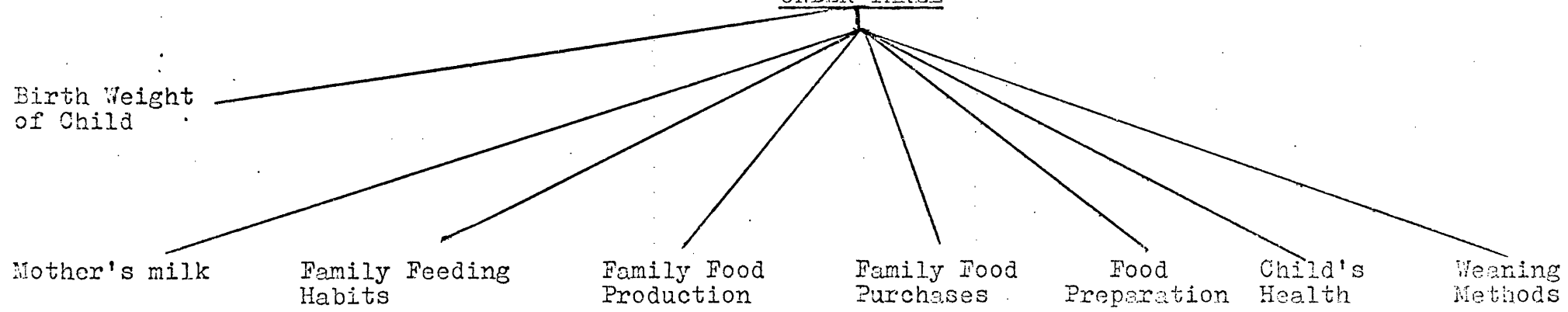


FIGURE 6.2

WEANING METHODS

Reason for Weaning	Time of Weaning	Manner of Weaning	Supplementary Feeding	Time of Starting Supplementary Feeding
New Pregnancy	Under 6 months	Gradual	Time and Labour for Special Feeds	Under 6 months
Child able to Walk or old Enough	6 to 12 months	Sudden	Restriction Uji	6 to 12 months
Child refuses or Mother ill	Over 12 months		Cost of Weaning Foods	Over 12 months

FIGURE 6.3

MOTHER'S MILK

Mother's Nutritional State	Mother's Health	Mother's Psychological State	Length of Lactation	Substitution of bottle feeding	Employment of Mother's
Increased need for protein	Parasitic load	Stability of marriage	Traditional Custom	Facilities for hygenic preparation	Feeding facilities at work
Increased need for calories	Endemic infections	Work burden	Onset of new pregnancy	correct concentration of feed	Nursing leave
Increased need for minerals	Breast Abcess etc.	Housing conditions	Commercial advertising	Avoidance of bacterial infection	
		Alcohol Intake	Fashion	Knowledge of person responsible	
			Illness of Mother		

FIGURE 6.4

FAMILY FEEDING HABITS

Influence of Grandparents	Number of Meals per Day	Distribution of Food within Family	Communal Feeding	Obligatory Hospitality	Food Prohibitions
Conservatism	Size of Child's Stomach	Father's share of Protein and Staple	Size of Hand	Special Food for Guest	Taboos: Eggs, Fish etc.
Rejection of new knowledge	Bulkiness of diet	Special Food for young children	Manual Dexterity	Sharing without increased quantity	Uji only as supplementary food
		Size of Family	Feeding Groups	Gifts to Relatives	
		Gravy only for Young Child			

FIGURE 6.5

FAMILY FOOD PRODUCTION

Available Water	Quality of soil	Quality of seeds	Agricultural Methods	Tools	Division of Labour	Traditional Animal Husbandry	Land Tenure System	Foodstuffs For Sale	Competition	Wastage
Rainfall	Rotation of crops	Trad. Methods of selection	Propagating	Hand tools only	Work burden of women	Cattle as Capital Wealth	Land Available to Family	Over-selling after Harvest	Competition for land	Wastage in growing crops
Irrigation	Use of Manure	Plant Breeding	Plant Spacing	Use of Oxen	Use of Mechanical aids	Over-grazing	Shifting Cultivation	Seasonal Income	Competition for Labour	Endemic Diseases
Drought	Use of Fertil-izer	Seed Dis-tribution	Fertilising	Inter-mediate Technology	Migration of men to towns	Low Milk Yield			Incentive of Cash	Wastage in Storage
Floods	Control of soil Erosion		Culitvating	Hire of equipment		Small stock for sale not consumption				

FIGURE 6.6

FAMILY FOOD PURCHASES

Family Income	Budgeting	Prestige Foods	Food Prices	Availability of Food	Food Quality Control
Adequacy of Income	Periodic Income	High Extraction Cereals	World Inflation-ary Trend	Marketing	Legislation
Who Controls Cash	Attraction of Durable Goods	Polished Rice	High Mark-up on Retail	Transport	Enforcement
Proportion available for food	Alcohol	Refined Sugar		Communications	Reference Laboratory
Wages Paid Monthly		Beverages			

FIGURE 6.7

FOOD PREPARATION

Water Supply	Personal Hygiene	Environmental Hygiene	Wastage in Unga Preparation	Cooking of Food	Food Preservation	Commercial Preparation
Purity of Water source	Water available for Cleanliness	Use of latrines	40% Loss in weight	Kitchen facilities	Drying	Fortification
Costliness of Containers	Availability of soap	Disposal of rubbish	Protein content Reduced from 9.0 to 5.8%	Cooking Methods	Smoking	Quality Control
Quantity Available for Family	Training of Children	Disposal of fluid waste	Calories Reduced from 355 to 259	Menu Planning	Salting	Commercial Promotion
Work Involved in obtaining Water	Knowledge of need	Protection of Food from Insects	Loss of Fat and Soluble Vitamins	Destruction of Vitamin C		
				Fuel Supplies		

FIGURE 6.8

CHILD'S HEALTH

Parasites	Infections	Psychological Factors	Anorexia	Taste of Foods
Malaria	Diarrhoeal Infections	Sudden Weaning	Special care during Sickness	Education in New tastes
Bilharzia	Tuberculosis	Removal to Foster Parents	Effect of Thiamine Deficiency	Sweet Malefactor
Hookworm	Measles			
	Other Fevers			

A random cluster of 23 per cent (N = 125) of the children aged 0 - 36 months was made. These children were weighed using a Salter clock-face hanging kilogram scale attached to a wicker basket. The mothers of these 125 children were asked the following questions for each child:

1. Date of Birth,
2. Whether the child was well on the previous day and, if not, what was the trouble,
3. Who fed the child on the previous day,
4. What the child was given to eat on the previous day for breakfast, lunch, supper and in-between, and by what means was the child fed,

and 5. How many times the child was breast-fed on the previous day.

All these children came from the universe of spatially contiguous plots utilised in the surveys discussed previously. Only one hostile response was met and there were no refusals. In this area, mothers seem quite certain of the birth date of their children and many have birth certificates.

The data collected was compared with the W.H.O. standards and the following results were obtained (Jelliffe, 1966).

Tables 6.1 and 6.2 show the percentages of children in various age groupings who fall into one or another class of nutritional status on the basis of comparisons of their weights for age with the W.H.O. standards. Taken as a whole, 27 per cent of the sample is at or below the 80

TABLE 6.1

Weight for Age Showing Percentages in Four Levels

AGE GROUP IN MONTHS	NUMBER EXAMINED	PERCENT 1ST LEVEL 90-81%	PERCENT 2ND LEVEL 80-71%	PERCENT 3RD LEVEL 70-61%	PERCENT 4TH LEVEL 60%-BELOW
0 - 3	8	0	13	0	0
4 - 6	7	14	0	29	0
7 -11	9	0	11	0	11
TOTAL					
0 -11	24	4	8	8	4
12-23	62	29	15	3	8
24-35	38	21	21	5	5
TOTAL					
12-35	100	26	17	4	7

TABLE 6.2

Age groups of 3 months and percentage of children below 80% Harvard Standard

TRIMESTER	AGE	N	% BELOW 80TH PERCENTILE
1	0 - 2	5	0
2	3 - 5	6	33
3	6 - 8	7	43
4	9 -11	5	0
5	12 -14	23	26
6	15 -17	15	27
7	18 -20	12	17
8	21 -23	14	28
9	24 -26	11	27
10	27 -29	8	50
11	30 -32	13	15
12	33 -35	5	60

TABLE 6.3

Prevalence rates assuming child with weight for age equal to or below 80th percentile of Harvard Standard is malnourished

SUBLOCATION	RATE
Gakarara	27%
MACHAKOS DISTRICT	
Masii	20%
Mitaboni	20%
Kasinga	29%
Itheini	35%
Kaewa	40%
Kaliluna	40%
Kombo	55%

percentile and 11 per cent is between the 70 per cent mark. Thus, on the basis of weight for age, Gakarara seems to have a prevalence of malnutrition in the range of rates that Nairobi's Medical Faculty has observed in the far drier Mahokos District to the south east (Table 6.3). Taking the 70th percentile as the beginning of clear-cut malnutrition, the 11 per cent prevalence rate is the same as that calculated by Wisner for a similar but less densely populated area on the eastern slopes of Mount Kenya, Mikumbune (Mbithi and Wisner, 1972).

Grouping by semesters of life, the period of greatest risk to these children seems to lie between 24 - 30 months. Grouping by trimesters, the high risk period seems to lie between 27 - 29 months. This result is consistent with the results of an analysis of the distribution of breast-feeding by age.

Table 6.4 breaks down the frequency of breast feeding by the median and modal age of the children. Although the pattern of early thriving on breast milk is clear, by 11 months the median is down to three or four breast feedings per day. By seventeen months it has cut down to one to two feedings per day and by twenty-three months the median child has been completely weaned from the breast. This weaning is likely to be reasonably successful, however, since the qualitative data shows that, inter alia, 50 per cent of the children receive some high quality protein between meals. It is worth noting that the nutritional value of breast feeding, in terms of the child's protein

calorific requirements noticeably declines after the first fourteen months.

Several points emerge from Tables 6.5, 6.6, 6.7, and 6.8. First, there is a great differentiation among the families in the types of food consumed. Although half of all the snacks consumed contain a source of vitamin C or A, and although more than half contain high quality protein, still nearly more than one quarter of the children have nothing. Secondly, the number of eggs reported to be consumed is quite high. 21 per cent of all snacks contain eggs, 10 per cent of all breakfasts and 2 per cent of all lunches and dinners. This is a recent innovation, emphasised by the ante-natal clinic, and against the traditional practise of the Kikuyu.

In general however the traditional nature of the children's food cannot be overlooked (Fisher, 1955). Bananas dominate as the chief starch staple followed by maize and beans. Although one finds that a minority of mothers feed their children on commercial formulae such as "Farex" and "Cerelac", no baby bottles are used at all. Likewise, very little bread and chapati are given. Cabbage and potatoes are alternative food sources that figure in the tables.

It should not be forgotten that the results summarised in Tables 6.5 to 6.8 are only qualitative. Especially where foodstuff given contains protein, the quantity could be very small indeed.

TABLE 6.4

Distribution of Breast Feeding by Child Age

NUMBER OF BREAST FEEDINGS PER DAY	AGE OF CHILD N	MEDIAN AGE (mos)	MODAL AGE (mos)
5 or more	11	6	6
3 - 4	20	11	13
1 - 2	11	17	17
0	76	23	23

TABLE 6.5

Analysis of between meal snacks (Foodstuffs used in percent of all snacks; N = 125)

RANK	FOOD	FREQUENCY	PERCENTAGE
1	Cow Milk	37	30
2	Eggs	26	21
3	Pineapple	21	17
4	Lemon Juice	16	13
5	Porridge	13	10
6	Tea	8	6
7	Orange Juice	7	6
8	Pineapple Juice	6	5
9	Bananas	5	4
	Mango	5	4
	Bush Fruit	5	4
10	Bread	1	1
	Tinned Meat	1	1
	Goat's Milk	1	1
	Margarine	1	1

TABLE 6.6

Analysis of breakfast (Foodstuffs used in percentage of all breakfasts; N = 125)

RANK	FOOD	FREQUENCY	PERCENTAGE
1	Cow Milk	66	53
2	Tea	47	38
3	Maize	32	26
4	Banana	25	20
5	Egg	12	10
6	Millet	10	8
7	Bread	7	6
8	Commercial Formulae	3	2
	Beans	3	2
	Tomato	3	2

TABLE 6.7

Analysis of lunches (Foodstuffs used in percent of all lunches; N = 125)

RANK	FOOD	FREQUENCY	PERCENTAGE
1	Banana	65	52
2	Maize	39	31
3	Cow Milk	38	30
4	Potatoes (Irish)	36	27
5	Beans	23	17
6	Rice	17	14
7	Oil or Fat	13	12
8	Commercial Formulae	8	6
9	Tea	7	6
10	Tomato	4	3
	Cabbage	4	3
11	Eggs	2	2
12	Bread	1	1
	Millet	1	1
	High protein foods including milk	71	57
	High protein foods excluding milk	33	26
	High protein food excluding milk and commercial formulae	25	20
	Sources of vitamins C, A and pro-vitamin A	16	13

TABLE 6.8

Analysis of dinners (Foodstuffs used in percent of all dinners; N = 125)

RANK	FOOD	FREQUENCY	PERCENTAGE
1	Banana	52	42
2	Cow Milk	44	35
3	Potatoes (Irish)	35	28
4	Miaze	30	24
5	Beans	29	24
6	Rice	17	14
7	Tomato	7	6
	Commercial Formulae	7	6
8	Oil or Fat	6	5
	Tea	6	5
9	Cabbage	3	2
	Eggs	3	2
10	NOTHING	2	2
11	Millet Gruel	1	1
	Sweet Potato	1	1
	Orange Juice	1	1
	High protein foods including milk	83	66
	High protein foods excluding milk	39	31
	High protein foods excluding milk and commercial formulae	32	26
	Sources of vitamins C, A and pro-vitamin A	19	15

Table 6.9 summarises the results from the question, "Who fed the baby yesterday?" It is obvious that 22 per cent of the mothers were absent or that, for some other reason, they did not feed the baby. This is a possible indicator of the drain of the mother's labour away to the coffee estates. The responsibility of the female side of the family for the children's welfare is stressed by the nature of the sex of those who fed the baby.

It should be noted that 90 per cent of all mothers said that the child was well yesterday. The illnesses which the majority complained of were, in order of frequency of mention, cough, malaria and fever, vomitting and diarrhoea and eye problems.

The status and diet of the children compares favourably with those in other highland areas of Kenya. With the continued deterioration of the soil and the emigration with only a minimal remittance of income, one can only foresee a parallel deteroriation of the diet and nutritional status.

What is more interesting, however, is that the children with low nutritional status correlate with those families adjudged to be in a stressed situation (Dema, 1968). Thus there is a positive correlation between families who have a head of household working away from home. This correlation, $r = 0.6$, is not an exact correlation because some of the men do not make enough money to be able to remit any of their income back to the rural home. The

TABLE 6.9

Who fed the Child?

MOTHER	78%
MAID	7%
SIBLING	8%
(Brother - 1%)	
(Sister - 7%)	
OTHER	7%
(Grandmother - 4%)	
(Aunt -3%)	

urban wage has really to support two homes. Secondly, low nutritional status is associated with the lack of formal parental education, the correlation here is higher, r = 0.78, because if a head of household has no formal education then the opportunity for outside employment is greatly reduced. Only if the family inherits a large tract of land can it become a viable unit. Low educational status is also correlated with low nutritional status because standards of cleanliness, knowledge of correct weaning periods etc., tend to be less well adopted by those of a lower educational standard. Thirdly, high nutritional status was also associated with the participation of the mother in a women's self-help group, r = 0.72. It is interesting to note that several of these self-help groups actually encourage educational programmes on child care. Lastly, there is an adverse correlation between high nutritional status and those farmers whose predominant crop is coffee, r = 0.59, indicating that there is a tendency for those children from families where subsistence food is not the primary agricultural product to be malnourished.

Thus, the situation of the village which was summarised at the beginning of this section - a situation in which complex pressures were seen to be building up - seems to be confirmed. The nutritional status is also correlated with the type of house in which the child is reared. Table 6.10 indicates the variables of house type which are used; not for morphological analysis, but as an index of wealth. There is a positive correlation r = 0.91 between children with low nutritional status and

those who live in thatched mud huts; a less strong correlation exists between the children with low nutritional status and those who lived in mud huts with old tin roofs where r = 0.83.

As a dependent variable linking the several independent variables that have been outlined in the analysis, nutritional status is an invaluable measurement. To a human geographer concerned with people and their environment it is a tool that provides many illuminating insights. To anyone who is interested in the welfare of people it points to the direction of immediate necessity. In terms of Gakarara, it indicates that a particular population which apparently possesses all the advantages necessary to escape from its traditional economy is unable to do so because of the various linkages which hinder development.

TABLE 6.10

House Types

INDEX	TYPE	PERCENTAGE
ROOF	Thatch	10.81
	Debe	47.29
	Iron	41.89
	Other	0.0
		n = 300
WALLS	Stick	8.1
	Mud	87.83
	Board	0.0
	Stone	4.05
	Other	0.0
		n = 300
PAINT	None	50.0
	Whitewash	44.59
	Paint at Edges	0.0
	Walls all Painted	5.4
		n = 300

CHAPTER SEVEN

CONCLUSION

The purpose of this chapter is to draw together the rather disparate contents of this thesis. Perhaps the most striking statistic to appear has been the fact that 27 per cent of the random sample population was at or below the 80 percentile on the basis of comparison of weight for ages with the W.H.O. standards. This indicates the prevalence of malnutrition in Gakarara and suggests that the village is in a state of ecological imbalance. Such an imbalance demonstrates that the village society has not increased its capacity for dealing with the environment; its science, technology and social organization prove inadequate in maintaining the ecological stability of the area; it is to be considered as underdeveloped.

It could be argued that the normal relationship between man and nature is one of commensalism. Man discovers the most productive sites for his agriculture and nature provides him with food and clothing. In order for this situation to continue, the man/nature complex is parasitic, to a certain extent, upon its food supply. In Gakarara, man is essentially a predator encouraging the extinction of finite resources. The extinction of finite resources occurs particularly in the form of soil erosion. Such a process is the result of man-induced factors i.e. the process of environmental degradation is essentially mis-management. Positive or negative management implies

control, but by whom? The argument of this thesis is that the control is not exercised by the peasants of Gakarara because of the constraints imposed upon them by the nature of Kenyan development.

Chapter One argues that the area within which Gakarara is located is one of high ecological potential. The volcanic bedrock provides a rich soil, Kikuyu Chocolate Loam, which receives an adequate rainfall spread over two seasons within each calendar year. Although some of the slopes exceed 15 degrees, most of the land is cultivable. In some areas above and below the altitude of Gakarara, intensive cash cropping of tea and coffee, respectively, occurs.

In Chapter Four, the land tenure pattern of the Kikuyu is discussed and the major conclusion is that both traditional and the current land divisions are models of spatial efficiency. Similarly, the allocation of various crops to different slope angles and the emphasis on intensive cultivation of the valley bottom are traditionally accepted and strengthened by the proposals of the Swynnerton Plan. One major change has, however, occurred with disastrous results: briefly, these reflect the fact that the tenurial system has shifted from that based on concepts of communal tenure to one based on statutory controls emphasising individual tenure. Such a change means that the land divisions, which were evolved on the basis of customary tenure, are not applicable to the present distribution of land. If one regards the linear land-use pattern as the strategy evolved in a complex man-environment

game, played according to the rules of customary land tenure, that maximises the return to the peasant, then one can readily appreciate that, as the rules change to those of statutory tenure, a different optimum solution needs to be found. Such a change to statutory land law has produced difficulties - notably the problem of inheritance with consequent land fragmentation, and the problem of peasant indebtedness. Both sets of problems stem from the fact that the land has been made alienable. With 62.5 per cent of the village households having less than one acre of land, it is possible to appreciate not only the extent and influence of the changing land law but it is also possible to raise the question of how the villagers cope with survival in such a community.

Chapter Five examines the agricultural economy of Gakarara. It is obvious that the colonial legislation to encourage and increase peasant agricultural production in Kikuyuland has enjoyed little success. Few innovations produced more than a minimum success. The present situation is that, although the Gakarara area is officially classified as a coffee producing zone, the ratio of the cash crop, coffee, to the staple, maize, is a ratio of 1:4. Only the elite of landowners, those possessing more than 3.5 acres of land, can afford to grow, and therefore sell, the cash crop. Farmers with less than 1.5 acres of land have to choose between coffee or maize; in fact, the distribution of maize growers, Figure 5.1, closely parallels that of land ownership, Figure 4.7. It is evident that the land is underutilised yet little lies

fallow; the work rate of the Kikuyu small-holder compares favourably with other African peasant agriculturalists. The small-holder's environmental knowledge is, however, rarely fully utilised because the holding is so small. With the accumulation of land as a form of social security by the richer individuals in the village, the creation of a landed gentry seems feasible. In itself, this situation would not be disastrous if there were some other agricultural outlet available to those who possessed less than 6 acres of land. Such an outlet does not exist except in the "opportunity" provided by urban employment.

When one considers the population data of Gakarara, it is apparent that the age distribution is heavily skewed in favour of the dependents within the village. This dependency implies ties, responsibilities and care that the adult population bears towards the siblings in the community (Chapter Two). Emotional and material demands cannot be satisfied if the members of the community are deeply involved in a basic struggle for survival; this struggle cannot be won within the constraints of the village's economy and so the village attempts to build external linkages, to seek alternative employment. Should a head of household obtain employment in one of the urban areas, then he immediately faces a drain upon his income because he has to support two households. Such a situation means that there is less ready money to pay debts, taxes and school fees. Of these major expenditures, it is the last, the school fees of his children, that will bear the economies. Education does not guarantee future employment

though lack of education virtually means unemployment. Economies like these are essentially false economies and perpetuate the process of the development of underdevelopment.

There is no adequate machinery either for expressing the situation or for rectifying the imbalance. Chapter Three indicates that the central administration of the country is all-pervasive but that it does not effectively reach grass-roots level. Such a situation does not particularly disturb the villagers and, of their own initiative, they have developed several self-help schemes. The fact that bureaucratic procedures hinder development is quietly accepted for, if the bottle-neck were not attributable to the Government, then it would be blamed upon the powerful élite, distinguished by their age and religion, existing within the village. Individually, villagers attempt to discover an answer to their own problems of survival but, should one find an external income, then the ties of immediate family, extended family and kinship will make heavy demands on that income.

The situation described is essentially an open system in disequilibrium. Because of the lack of available agricultural land, the community is forced to seek external sources of income. The available external employment is largely situated in the towns so that the head of household has to establish and run a second home in an urban area. This process means that many of the male population are effectively removed from the village

labour force and, because of their expenditure in the urban area and the necessity to meet certain debts, they can contribute little to bolstering the village's economy. The women, meanwhile, prefer piece-work labour on the coffee estates to running their own farms. Thus, more labour is drained away from the economy of the village. Only mothers with young children and the old people are permanently part of the village's economy. The land, however, requires careful cultivation if the ecology of the area is not to be damaged. Little labour is available to maintain old terracing let alone build new ones. The introduction of maize as the staple crop and the continued use of coffee as a cash crop has led to the destruction of much of the former undergrowth; yet this undergrowth is essential to stop the soil erosion which naturally occurs because of the steep slopes and heavy rainfall. The lack of labour means a reversal to subsistence agriculture but the continued depletion of the labour reserves may jeopardise even this precarious existence. Such a process can only be viewed as ecological devolution, for the inherent value of the environment is decreasing and the human population is not gaining from that decrease.

In the context of Gakarara, it seem pointless to consider such economic concepts as profit maximization where the peasant farmer is seen as optmizing the relationship between marginal costs and returns. Furthermore, the concept of opportunity cost is only applicable in a negative and, therefore, limited form. If one returns to a basic definition of economics, one

can easily appreciate that the situation does not represent a choice between scarce resources because alternative decisions are constrained; unless the household has access to more than three acres of land, it must seek external income and should the household successfully gain external employment, then the farm will deteriorate.

Most of the villagers emphasise that unemployment is the major constraint to village development (Table 7.1). In isolating this cause, they are not discussing underemployment on the farms but the lack of urban opportunities. Other villagers discuss the decline of the cash crop and the parallel decline of the quality of the land. Similarly, others linkthe lack of food and the health problems consequent upon the reversal to subsistence agriculture. More interstingly, the villagers highlight certain pathogical signs of underdevelopment, especially the excessive drinking. Kandara as a division also seems to have a higher criminal conviction rate than do most other divisions in Kenya.

The village's position vis-a-vis the capital, Nairobi, mirrors the relationship between Kenya and the developed world. The constraints upon the development of Gakarara are imposed by the government of Kenya. Their unwillingness to concentrate upon the rural areas, to reform the Land Law, to encourage a self-sufficient economy and to face the reality of social injustice stems from their willingness to depend upon developed countries. Such dependency prohibits true development for it constrains indigenous

development and may eventually destroy the traditional social organization upon which all indigenous, grass-roots development must be built.

TABLE 7.1

PERCEIVED PROBLEMS OF DEVELOPMENT

Transport	1.45%
Decline of Cash Crop	18.9%
Unemployment	59.7%
Health	16.01%
Population Pressure	2.91%
Poor Quality of Land	17.47%
Lack of Good Food	18.97%
Taxes and School Fees	2.91%
Drinking	4.36%
Other	1.45%
Don't Know	1.45%
No Reply	4.46%

APPENDIX I

CHOICE OF VILLAGE

The researcher concentrated on microscale research in order accurately to anaylse the process of underdevelopment. The choice of village was largely fortuitous. The Swahili lecturer at the School of Oriental and African Studies came from Gakarara. While the author of this thesis was studying Swahili at SOAS, he decided to examine Gakarara as a case study in underdevelopment because it seemed from description to be in a transition phase between the traditional and modern economy, a transition that meant socio-economic upheaval. Subsequent research indicated that this was a valid judgment. Originally it was intended to examine more than one village, but the fascinating complexity of underdevelopment in Gakarara became the focus of the research and the idea of comparative village studies was abandoned.

AREA SURVEYED

It was decided that as the village was not a clearly defined morphological unit it was best not to sample the area, except for physical data, but to complete a total survey of basic socio-economic data in an area just exceeding one square mile. Although all the population surveyed identified themselves as belonging to Gakarara,

a few respondents on the periphery of the area felt an equal identification with Kandara, the nearest town. It was impossible in such cases, without a clear knowledge of the respondent's personal history, to clearly delimit if they should in fact be included in the survey of Gakarara village. Eventually all were included because, firstly, the researcher was unable accurately to ascertain personal history but, more importantly, because he was attempting to analyse the process of underdevelopment on a microscale and was not simply providing a village description.

IMPLEMENTATION OF THE QUESTIONNAIRE

All questionnaires, except questionnaire VII, were translated into Kikuyu. Questionnaire VII was administered in English.

All the remaining questionnaires were translated into Kikuyu, retranslated into English to see if any discrepancies occurred and then translated back into Kikuyu. After the pilot studies were completed, the questionnaires were checked to see if any major difficulties had arisen. Only one minor change, in the organization of questions, was necessary before the full survey was begun.

DATA STORAGE

A complete deck list of code questionnaire results is available on request.

DATA ANALYSIS

The data was analysed on the Toshiba BC 162 3G. Programs utilised in the data analysis are contained in Appendix 9.

PHYSICAL SURVEY

Extensive ecological surveys were carried out in Gakarara between June and October 1972. Slope measurements and soil analyses were carried out by colleagues from the School of Oriental and African Studies. For both slope and soil samples a total of 50 measurements were made. The slope measurements were interpolated to produce Figure 1.3, the physical map of Gakarara. Soil analyses were carried out in the University of London.

QUESTIONNAIRE SURVEYS

Seven questionnaires were completed. Most of the tabular material in Chapters 2 - 6 has been based on material from the questionnaires. Questionnaire I provided material for Chapter 2, on population; questionnaire II on land and agriculture provided material for Chapters 4 and 5; questionnaire IV provided material for Chapter 2 on the political composition of the village; questionnaire VII was used to provide material for Chapter 6 on nutrition. Questionnaires III and VI were used to supply additional material to check data obtained in questionnaires I, II and IV such as tax related to earnings and also to provide

some statistics to back up field observations, e.g. to classify the number of mud and wattle houses. Questionnaire V was utilised when no occupier was present over the 5 month fieldwork period; this questionnaire and questionnaire II was checked with the Land Registry in Murang'a. Questionnaire V was used to ensure that the research design had complete coverage.

QUESTIONNAIRE SURVEY METHODOLOGY

Questionnaires I - IV were completed on 300 spatially contiguous holdings. Previously 50 pilot questionnaires were completed outside of the survey area. These 50 questionnaires are not included in the analysis contained in this volume. 25 examples of questionnaire VI were also completed outside the survey area as pilot questionnaires; the 25 pilot questionnaires are not contained in this volume. Questionnaire VI as a sample survey used to check data from questionnaires I, II and IV was based on random sample to provide 50 per cent coverage of the 300 spatially contiguous sample.

Questionnaire VII was based on a random cluster of 23 per cent of the children between the ages of 0 - 36 months. After discussion with the Social Medicine Faculty, University of Nairobi, it was decided that a randomly based survey was the best method to employ in this particular situation given the nature of the survey.

ONGOING OBSERVATIONS

Parallel to the questionnaire data were ongoing field observations. The researcher attempted to live as one of the villagers, eating the same food, observing the same daily routine etc., in an attempt to appreciate the constraints that the villagers continually experienced.

CONCLUSION

This detailed description of research methodology should enable the reader to come to a firmer conclusion about the most important question raised by this thesis - namely, whether the process of underdevelopment as described in this work is unique to Gakarara or whether a similar process is occurring elsewhere in developing countries.

APPENDIX 2

QUESTIONNAIRE ONE

GENERAL FAMILY DATA

1. How many people live in this household?

FOR EACH MEMBER OF THE FAMILY GIVE THE FOLLOWING DETAILS.

Name

Relation to the head of the household

Age

Sex

Marital Status

Place of Birth

Length of Residence if Born Outside of Village

Length of Education

2. Are any of your family living away from home?

FOR EACH MEMBER LIVING AWAY FROM HOME GIVE THE FOLLOWING DETAILS.

Name

Relation to the Head of the Household

Age

Sex

Marital Status

Length of Education

Occupation

Place of Residence

Length of Time Away From Home

Length of time Before Return

How often Does He/She Return

Monthly Earnings

Monthly Remittances

APPENDIX 3

QUESTIONNAIRE TWO

AGRICULTURAL ECONOMY

Total Size of Holding

Total Number of Plots

THIS YEAR WHAT CROPS DID YOU GROW?

Area Planted

Area Harvested

Production

Amount Sold

Total Return

Price per Unit ... SPECIFY UNIT

Date Sold

Place Where Sold

Sold to Whom 1) COOPERATIVE

2) PRIVATE INDIVIDUAL

3) OTHER

LAND USE

PLOT	1	2	3	4	5	6	7	8	9	10
Area of Plot										
Type of Land										
GOOD										
AVERAGE										
POOR										
Number of Fields										
Rented or Owned										
Manner of Aquisition										
How Much Land is Owned Outside the Village										

AGRICULTURAL PRODUCTION

Did you Plant and Harvest Twice Last Year? YES/NO

PLEASE GIVE THE FOLLOWING DETAILS OF THE LAST HARVEST

Area Planted

Area Damaged

DROUGHT

FLOOD

INSECTS

DISEASE

OTHER

Area Harvested

Total Production

Estimated Production in Normal Year

Amount Sold

AGRICULTURAL LABOUR

PLEASE GIVE THE FOLLOWING INFORMATION FOR THE LAST HARVEST

Date of Planting

How Many People Involved

How Many Non-Family Members Involved

Length of Time Taken for Planting

Date of Harvest

How Many People Harvested

How Many Non-Family Members Involved

Length of Time Taken for Harvest

AGRICULTURAL PROCESS

PLEASE GIVE THE FOLLOWING INFORMATION FOR THE LAST HARVEST

Did You Use Any of The Following to Help You ?

TRACTOR

OX PLOUGH

OTHER

Did You Use Fertiliser ?

NATURAL

CHEMICAL

From Where Did You Get Your Seed ?

Are You Using Any New Kinds of Seed ?

LIVESTOCK

Number of Cattle	GRADE EUROPEAN	NATIVE
Age UNDER 3 YEARS		
3 - 5 YEARS		
OVER 5 YEARS		
Number of Cattle Purchased Last Year		
Price Per Unit Bought		
When Bought		
Number Sold Last Year		
When Sold		
Where Sold		

Number of Goats	
Age UNDER 1 YEAR	
1 - 3 YEARS	
OVER 3 YEARS	
Price Per Unit Bought	
When Bought	
Number Sold Last Year	
When Sold	
Where Sold	

Number of Chickens	
Age UNDER 3 MONTHS	
3 - 6 MONTHS	
OVER 6 MONTHS	
Price Per Head	
Sold When	
Sold Where	

OTHER FARM INCOME

Area

Total Production

Amount Sold

Price Per Unit

Total Return

When Sold

Sold To Whom

COOPERATIVE

PRIVATE INDIVIDUAL

OTHER

When Sold

ADDITIONAL INCOMES

Do You Participate in Any Handicraft Industry ? YES/NO

Type of Industry

Number of People Involved

Cost of Equipment

Number Sold

Price Per Unit

Are You Employed Anywhere Else

Type of Employemnt

Income

Place of Employment

APPENDIX 4

QUESTIONNAIRE THREE

STANDARD OF LIVING INDEX

Do you own this house ?

How old is this house ?

Is there any major repair necessary to the house?

Is there any major extension ?

Do you have a wristwatch

radio

bicycle

Sewing Machine

What GPT did you pay last year

24/-

48/-

72/-

more than 72/-

none

How many times did you visit

Fort Hall

Thika

Nairobi

Naivha

Nyeri

last year

Are your family members of the farming organizations? If so please specify.

APPENDIX 5

QUESTIONNAIRE FOUR

Do you go to Church?

YES

NO

NR

If yes, which one

CATHOLIC

PCEA

CCM

FULL GOSPEL

INDEPENDENT

METHODIST

OTHER (specify)

NR

How often do you go to a Church meeting or service?

MORE THAN ONCE A WEEK

ONCE A WEEK

ONE TO THREE TIMES A MONTH

LESS OFTEN

NR

Do you discuss any of the following matters there?

FARMING

HEALTH

CLOTHING

Are you a leader of any group?

Are you a committee member of any group?

YES

NO

NR

Which group do you belong to?

CHURCH

DEMARCATION

WOMEN'S GUILD

HOME ECONOMIC GROUP

SHAMBA GROUP

HEALTH CENTRE

SCHOOL

WATER PROJECT

MARKET

COOPERATIVE

OTHER (Specify)

NR

How often do these groups meet?

ONCE A WEEK

ONCE A MONTH

LESS OFTEN

In the past two years have you worked on any Haranbee projects?

YES

NO

NR

Which project did you work on?

WATER PIPES

WATER FURROWS

ROAD

BRIDGE

PRIMARY SCHOOL

NURSERY SCHOOL

SECONDARY SCHOOL

HEALTH CENTRE

CATTLE DIP

OTHER (Specify)

How long did you work on these projects?

LESS THAN ONE MONTH

1 - 3 MONTHS

MORE THAN 3 MONTHS

Why did you want the Kandara water scheme?

SAVE TIME

SAVE LABOUR

MORE HEALTHY

OTHER (Specify)

From whom did you here about the water scheme?

MP

DISTRICT OFFICER

CHIEF

OTHER

Did you attend the meeting when the people voted for the water scheme?

YES

NO

LEADERSHIP QUESTIONNAIRE

Characteristics	Worked Outside
	Literate
	Claimed to speak a National Language
Age Group	30
	31 - 40
	41 - 60
	61 +
Years of schooling	2
	3 - 6
	7 - 10
	11 +
Correct Response	
Identify the Following	Chief
	Local Kann Leader
	M.P.
	District Officer
	Date of Independence
	Madaraka Day
	V.P. of Kenya

APPENDIX 6

QUESTIONNAIRE FIVE

FOR EACH SHAMBA WITHOUT AN OCCUPIER

Location Number

Name of Owner

Other Shamba or Occupation

Estimation of Plot Size

State of Soil Good.... Indifferent.... Poor....

State of Crops Good.... Indifferent.... Poor....

Estimated Percentage of Uncultivated Land

APPENDIX 7

QUESTIONNAIRE SIX

SOCIAL QUESTIONNAIRE

(1) House Type

(a) Roof
- thatch
- debe
- iron
- other

(b) Walls
- sticks
- mud
- board
- stone
- other

(c) Paint
- none
- whitewash only
- paint trim at edges
- walls all painted

(2) Clothing Worn by Respondent

Shoes	None
	plastic
	leather
	other
Dress	none
	torn
	patched
	intact
Shirt	none
	torn
	patched
	intact
Jewelry	none
	one piece
	more

UNEMPLOYMENT

(1) Do you have a child over 18 years old who lives here but has no shamba of his own?

(a) NO

(b) YES 1.

2.

3.

4.

More than 4

(2) If more than one take eldest?

What does he/she do

(a) help on shamba

(b) employed locally

(c) looking for work

(d) stays with friends

(e) does nothing.

(f) other

SOCIAL CONTACT

(i) Are you a committee man or leader of any group?

(a) group

(b) position

(ii) When you are walking on your farm or in the house people stop to talk to you about various matters?

How many people stopped to talk with you yesterday?

How many were from this village?

Last time you left the village how many people did you stop to visit?

How many of these people were from this village?

(iii) Who would you contact if you had a problem with

	NAME	VILLAGE
(a) farming		
(b) health		
(c) buying something expensive		
(d) an argument with a neighbour		

SOCIAL PERSPECTIVES

Do you think this village has more, less, or about the same number of health problems as other parts?

(1) more
(2) less
(3) same
(4) don't know
(0) NR

Is the village more/less wealthy than other parts of Kandara?

(1) more
(2) less
(3) same
(4) don't know
(0) NR

Do you think the people of this village are more, less or equally co operative compared with other parts?

(1) more
(2) less
(3) same
(4) don't know
(0) NR

How much do the people of this village care about what their neighbours think of them?

(1) a little
(2) not at all
(3) don't know
(0) NR

Do most people here drink beer very often, just occasionally or almost never?

(1) often
(2) occasionally
(3) never
(4) don't know
(0) NR

Do you think it is all right for people to use magic to get what they want?

(1) No
(2) Yes
(3) don't know
(0) NR

Do you think some people here use magic in this way?

(1) No
(2) Yes
(3) Don't know
(0) NR

Do you think life is better now than it was before the Europeans came?

(1) No
(2) Yes
(3) Don't know
(0) NR

Do you think life will be better twenty years from now than it is now?

(1) No
(2) Yes
(3) Don't know
(0) NR

What do you think of someone who is always first to try a new thing? (CODE AS:)

(1) favourable
(2) indifferent
(3) antagonistic
(0) NR

Do you generally try new things soon after you hear about them, or do you like to wait and see what others are doing first?

(1) try soon
(2) wait
(0) NR

What do you say is the greatest problem people have here?

(1) transportation
(2) few cash crops
(3) no jobs
(4) health
(5) too many people/too little land
(6) land worn out
(7) uprooting cash crops
(8) not enough food
(9) housing

Continued:

(10) unco-operativeness
(11) quarrels
(12) schools
(13) taxes and school fees
(14) drinking
(15) other (specify)
(16) don't know
(0) NR

(IF RESPONDENT FINDS DIFFICULTY ANSWERING, READ LIST TO HIM)

APPENDIX 8

QUESTIONNAIRE SEVEN

NUTRITION

Children were weighed using a Salter clock face hanging kilogram scale attached to a wicker basket. The mothers of the children were asked the following questions for each child.

1. Date of birth
2. Was the child well yesterday?
   . If not what was the trouble?
3. Who fed the child yesterday?
4. What was the child given to eat yeaterday?
   (a) Breakfast
   (b) Lunch
   (c) Dinner
   (d) In between
5. By what means was the child fed?
6. How many times was the child breast fed on the previous day?

APPENDIX 9

This appendix contains the programs utilised in the data analysis of this research. The programs contained are:

(1) STANDARD DEVIATION

(2) CHI SQUARED

(3) SPEARMAN RANK CORRELATION

(4) ANALYSIS OF VARIANCE

and (5) CORRELATION AND REGRESSION

The programs were especially developed for the Toshiba BC 1623G.

STANDARD DEVIATION

Standard Equation: $\sigma x = \sqrt{\frac{(x - \bar{x})^2}{N}}$

Computational Equation: $\sigma x = \frac{1}{N}\sqrt{N\Sigma X^2 - (\Sigma X)^2}$

Computational Requirement: ΣX^2 Set in Memory 1

ΣX Set in Memory 2

Programmed Steps: Decimal Setting 4.

ON, A, RECIPR↓, PR-I↓, ENTER NUMBER, M+, X, =, C, RECIPR↑, (ENTER NUMBER, +, C), REPEAT, PRI↑, T, ÷, ENTER NUMBER, =, Λ↑, R, ÷, ENTER NUMBER, =, x, =, -, T, +, $\sqrt{\ }$, ANSWER

CHI SQUARED TEST

Standard Equation: $x^2 = \frac{\Sigma(O - F)^2}{E}$

Computational Equation: $X^2 = N \left(\frac{\Sigma O_{ij}^2}{R_i \times C_j} - 1 \right)$

where R_i is the Row total of i.

C_j is the Column total of j.

and O_{ij} is the observed value of row i and column j.

Computational Requirements: Accumulation of intermediate values of $O_{ij}^2 / (R_i \times C_j)$ into Memory 2.

Programmed Steps: Decimal Setting 4.

ON, RECPR ↓, PR-I ↓, ENTER O_{ij}, x, =, -, ENTER R_i, =, -, ENTER C_j, =, M+, C, REC-PR ↑, [ENTER NEXT O_{ij}, =, ENTER R_i, =, ENTER C_j =, C] REPEAT, [ ], PR-I ↑, R, +, 1, -, x, ENTER NUMBER, =, ANSWER.

SPEARMAN RANK CORRELATION

Standard Equation: $Sr = 6\left(\frac{\Sigma(R_1 - R_2)^2}{N(N^2 - 1)}\right)$

Programmed Steps: Decimal Setting 3.

ON, RECPR ↓, PR-I ↓, A ↓, ENTER R_1, +, ENTER R_2 -, x, =, C, RECPR ↑, ENTER R_1, =, ENTER R_2, =, C, PR-I ↑, ENTER NUMBER, M+, x, =, +, 1, -, x, R, =, ÷, T, Ex, =, ANSWER.

ANALYSIS OF VARIANCE

Standard Equation:

Computational Equation: $$F = \frac{\Sigma CT^2 - \frac{r\Sigma x}{N}}{\Sigma CT^2 - r\Sigma x2} \times \frac{C(1 - r)}{(C - 1)}$$

Computational Requirements:

r = rows

C = columns

ΣCT^2 = sum of column totals squared (CT^2)

ΣX = sum of X

ΣX^2 = sum of X^2

Programmed Steps: Decimal Setting 4.

ON, RECPR↓, PR-I↓, A↓, ENTER NUMBER, M+, x, =, REC-PR↑, (ENTER NUMBER, =, C,) REPEAT TO END OF COLUMN, PR-I↑, A↑, R, COPY A1, x, =, COPY B1, [CM, A↓, PRI↓, (ENTER NUMBER [2ND C] , =, C), REPEAT TO END OF COLUMN, PR-I↑, A↑, R, COPY A2, x, =, COPY B2], REPEAT [ ], THEN, PR-I↑, T, x, ENTER NUMBER OF ROWS, =, I(COPY), COPY AS, ADD TOGETHER, ENTER TOTAL, x, ENTER ROW NUMBER, ÷, ENTER GRAND TOTAL OF OBSERVATIONS, =, COPY II, COPY BS, ADD TOGETHER, COPY III, ENTER ROW NUMBER, 1, +, x, ENTER COLUMN NUMBER, =, M+, C, ENTER COLUMN NUMBER, +, 1, -, ÷, R, EX, =, COPY IV, FINAL CALCULATION, $F = \left(\frac{III - II}{III - I}\right) \times IV$, ANSWER.

CORRELATION AND REGRESSION

Standard Equation:

Computational Equation: $$r = \frac{N\Sigma XY - \Sigma X.\Sigma Y}{\sqrt{N\Sigma X^2 - (\Sigma X)^2}.\sqrt{N\Sigma Y^2 - (\Sigma Y)^2}}$$

$$b = \frac{N\Sigma XY - \Sigma X.\Sigma Y}{N\Sigma X^2 - (\Sigma Y)^2}$$

$$a = \frac{\Sigma Y}{N} - b\frac{\Sigma X}{N} = N(\Sigma Y - b\Sigma X)$$

Computational Requirements: As the machine has only got two memories, the computational requirements could only be acquired by two programmes with the necessary copying of some intermediate results. This could be done conveniently by the construction of a table as follows:

ΣX	F	A	$(\Sigma X)^2$
ΣX^2		B	$N\Sigma X^2$
ΣY	G	C	$(\Sigma Y)^2$
ΣY^2		D	$N\Sigma Y^2$
ΣXY		E	$N\Sigma XY$

The values in the left hand column are supplied directly by the two programmes, while the right hand values could be readily obtained by ordinary calculations.

Programmed Steps: Decimal Setting 4.

ON, RECPR↓, PR I↓, A, ENTER FIRST X, M+, X, =, C, PR I↑, [ENTER X, =, C,] REPEAT[ ], T, X, ENTER NUMBER, =, (B), R (F), X, = (A), CM, PR-I↓, [ENTER FIRST Y, =, C,] REPEAT[ ], T, X, ENTER NUMBER, = (D), R (G), X, = (C), C, REC PR↓, PR II↓, ENTER X, X, ENTER Y, =, C, REC PR↑, [ENTER X, =, ENTER Y, =, C,] REPEAT[ ], PR II↑, T, X, ENTER NUMBER, = (E), C.

Final Calculations: $EFG = E - (F \times G)$

$$BA = B - A$$

$$DC = D - C$$

$$ABCD = BA \times DC$$

$$r = \frac{EFG}{\sqrt{ABCD}}$$

$$b = \frac{EFG}{BA} = BB$$

$$BF = BB * F$$

$$a = n \times (G - BF)$$

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