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**INCOMES, POVERTY AND FOOD SECURITY
IN THE COMMUNAL LANDS OF ZIMBABWE**

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1. INTRODUCTION

This paper presents some findings of a research project (1) whi[ch]
has focussed on understanding the determinants of rural incom[e]
and food security in Zimbabwe's Communal Lands. The research se[t]
out to explore why there is poverty and hunger and to explain i[ts]
incidence and extent. In attempting to answer such bro[ad]
questions it is clear that one has to address a wide range [of]
historical and structural factors. Ideally a better understandi[ng]
at the micro and macro levels is required. How, for example, a[re]
the historically structured contexts (at the local leve[l]
interacting with both drought years and the changing regiona[l]
national, and wider geopolitical contexts? Consideration of [a]
multiplicity of factors clearly poses a number of problems for [the]
analysis of the causes of poverty and hunger. Consequently, the[re]
is much leeway for differing interpretations and emphasis.

Unfortunatly perceptions of this complex issue have tended [to]
cloak (rather than illuminate) our understanding. The fir[st]
deficiency has been the tendency to view the recent 'transito[ry]
droughts' of the 1980's, as the dominant cause of poverty a[nd]
hunger. The second misunderstanding has emerged from use of t[he]
evidence of a growing peasant-base to the (aggregate) share [of]
marketed food surpluses as proof of a broad rur[al]
self-sufficiency and food adequacy.

Our findings clarify that this is simply not the case. It is t[he]
result of a slide into aggregate vision and a conseque[nt]
misreading of Zimbabwe's 'agricultural success story'. T[he]
aberration of poverty and hunger (in an apparently bountif[ul]
situation) has on occasion given rise to devisive explanations [of]
malnutrition in terms of peasant irrationality. Zimbabwe c[an]
boast of a long-standing national food self-sufficiency. It c[an]
also point to a marked post-independence shift in the share [of]
nationally marketed food as controlled by the peasantry (Stanni[ng]
1985). However these facts have to be reconciled with evidence [of]
a chronic maldistribution. Twenty percent of children under fi[ve]
years have second and third degree malnutrition. Thirty perce[nt]
of children are stunted. (Moyo et al 1985; UNICEF; 1984).

Nutrition data suggests there are severe short-comings to [an]
undifferentiated perspective on the labour migrant economies [of]
southern Africa, a point more widely emphasised in the literatu[re]
(Peters, 1983, Lewis, 1984). While there remains much debate [on]
precisely how we should conceptualise the processes and socia[l]
forces underlying the existence of a differentiated peasant[ry]
such a conceptualization is central to our analysis. In thi[s]
regard two important themes have emerged:

i) A capacity to accumulate and the existence of rural socia[l]
differentiation is a function, primarily, of non-farm (urban[)]
cash and/or remittances of 'household' economic activities[.]
Furthermore, off-farm incomes are not supplementary to rura[l]

agricultural incomes, but directly influence agricultural production. The rural poor are thus defined by a lack of direct access to wage incomes and a narrow agricultural base to their rural income (Murray 1987).

ii) We need to vigorously incorporate a debunking of the idealization of the relative integrity of the rural household. (Folbre, 1986; Izzard, 1985; Peters, 1983; Brown, 1983). How important is conflict and inequality within the family, especially as regards the distribution of food? This latter issue is not examined below but is part of our ongoing research.

As a practical part of identifying at-risk groups, we have isolated 16 clusters of economic activities which characterise the dominant economic stances of Zimbabwean rural households. This approach draws on Sen´s concept of "entitlement relations" (Sen 1981). We see this as an important part of the immediate short-term policy context. At another level, however, one has to address the issues of how and why different patterns of entitlement relations have come about? This latter approach underlies a policy analysis for a more fundamental restructuring of people´s life chances.

2. THE OBJECTIVES AND FOCUS OF THE RESEARCH

Policy-makers may or may not see the glaring contradictions of malnourished infants, children and mothers-at-risk, standing right next to the mountains of food being piled up at the district and regional depots. Much of this food comes from a rural hinterland, where under-nutrition is a basic feature of life for a significant segment of the community. Indeed, in Zimbabwe, the spectre of the coexistence of increasing exports of food "surpluses" to the SADCC region and a significant domestic hunger, remains a very real possibility.

If we are to consider policies for intervention, then Zimbabwe needs its own analysis in order to:

(1) better understand the factors which may intervene between the production of food and its consumption; and,

(2) to assess whether these factors vary in any systematic way for particular groups and classes.

Focusing on the Communal Lands, this survey provides empirical evidence on both the factors which are a) affecting the quantitative availability of food, employment, incomes and purchasing power; and, b) to a lesser extent, how storage and distribution issues affect household situations. The research contributes to a better understanding of the causes of rural poverty, low incomes, a lack of purchasing power and food. What are the different circumstances or routes leading to rural

poverty? The provision of less gross characterizations of rural poverty helps in identifying specific and focused policy measures which will affect food entitlements through both production and distributions measures.

2.1 The sample

The survey enumerated a total of 600 households (cases) from the Communal Lands. The sample size, in relation to the universe of the Communal Lands is inevitably small. However, compared to other surveys, this study has both breadth and depth: breadth in the sense of a coverage of 600 households over five agro-ecological zones, and depth in the sense of the survey's coverage of a wide range of rural incomes (i.e. as opposed to narrow agricultural or farm management surveys, etc.)

Control of the quality of the output of the survey has been effected at all stages of the project. Firstly, through pre-testing and design of a questionnaire amenable to internal consistency checks. Secondly, through enumerator and supervisor training and orientation. Thirdly, through close and early monitoring of the first returns from each enumerator. Fourthly, through consistency checks by the principal researcher, who formatted all the data. Fifthly, through a double punch data validation entry system, and finally, through a computerised data validation procedure.

The 600 household sample was split into 20 emuneration areas. Thirty households were enumerated within each area. The detailed breakdown of these areas into the Provinces and Districts and Communal Areas is given in table 2.1. The broad characteristics of the areas are summarised in table 2.2. Table 2.3 provides a breakdown of the distribution of households between agro-ecological zones. The numbers of households within each agro eco-zone were distributed to facilitate analysis of sub populations within any one zone (i.e., there was a need too have sufficient numbers within any one zone, between 120-150 cases). This sampling procedure would a) facilitate a comparison between zones; and b) provide some control over agro-ecological effects when examining socio-economic factors such as endowments (land, labour, cattle, credit and tools) at the level of the household. Clearly an analysis at the whole sample level was envisaged. (N.B. Zone 1 being small in absolute terms and atypical of the communal areas as a whole, was limited to 60 cases. Some 120-150 households were enumerated in each of the remaining four zones. See table 2.3.

Zimbabwe is divided into five natural regions on the basis of soil type, rainfall and other climatic factors. The first three regions are suitable for intensive crop and livestock production whereas the remaining two offer limited scope for agricultural development.

Table 2.1
Selected enumeration areas

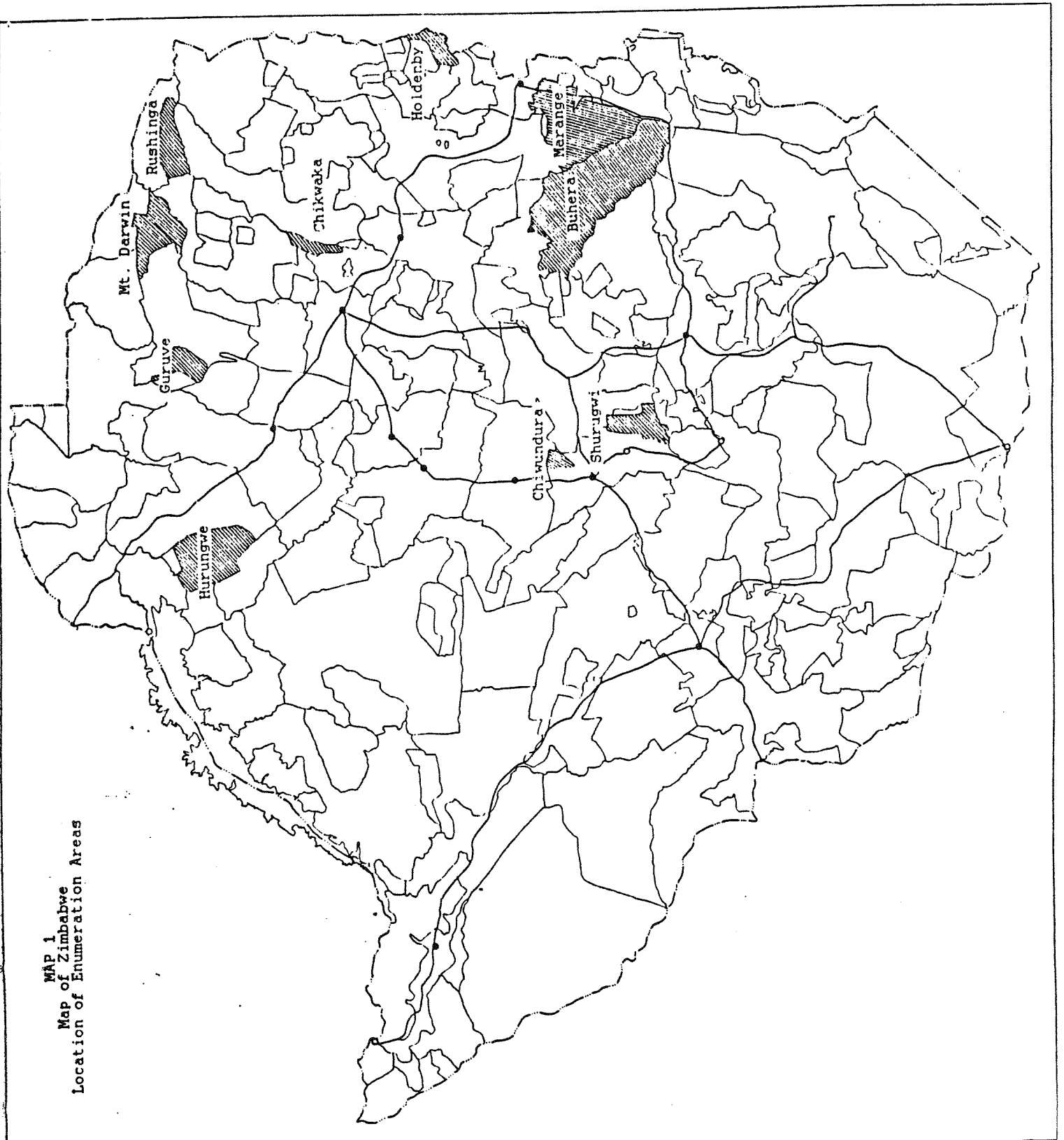| Province	Area	Enumeration	No. HHs.
Mashonaland East	Chikwaka	04.08	60
Mashonaland Central	Guruve	06	30
	Mt. Darwin	22.11	60
	Rushinga	03.07	60
Manicaland	Holdenby	01.03	60
	Marange	09.05	60
	Buhera	52.57	60
	Chakowa	03.01	60
Midlands	Chiwundura	05	30
	Shurugwi	09.004	60
Mashonaland West	Hurungwe	02.10	60
Total			600

Table 2.2
Characteristics of the selected enumeration areas

Area	Agro-eco zone	Pop density 1982 persons/km2	Land utilisation 1974-75 crop/tot %	Cattle stock rates Ha/head
Chikwaka	IIA	41+	8-12	2-4
Guruve	IIB	41+	12-20	5-8
Mt.Darwin	IIB	41+	12-20	5-8
Rushinga	IV	11-20	4	very low
Holdenby	I	21-40	8-12	5-8
Marange	IV	21-40	20-28	2-4
Buhera	V	21-40	12-20	2-4
Chakowa	III	41+	12-20	2-4
Chiwundura	III	41+	12-20	2
Shurugwi	III	41+	20-28	2-4
Hurungwe	III	20-41	8-12	5-8

Table 2.3
Summary of households by agro-ecological zone

Ecozone	Number of households
I	60
II	150
III	150
IV	120
V	120
Total households	600

MAP 1
Map of Zimbabwe
Location of Enumeration Areas

Holderby

Rushinga

Mt. Darwin

Chikwaka

Marange

M.

Buhera

Guruve

Chiwundura

Shurugwi

Hurungwe

Within each of the 20 enumeration areas, the 30 households were sampled in the following way: on the basis of a complete listing of the households in the enumeration areas (by definition approximately 96-104 households) and on the basis of details on each household's principal economic activity, holding size, stock ownership and access to finance (seasonal or other loans), the entire sample was stratified to indicate wealth. A systematic sample was then drawn from a random entry point into the stratified population. As such a spectrum from "rich" through to "poor" (in terms of land, cattle and credit) were sampled in each enumeration area.

2.2 Foci of the questionnaire

The questionnaire was organised into seven broad areas. It was administered as a single interview. All responses were thus based on the recall of the respondent. Some deliberate overlap or duplication was incorporated to provide for internal consistency checks. The seven areas cover: (1) household composition and seasonal work; (2) work of resident members; (3) changes since 1980; (4) domestic arrangements for water, wood and sanitation; (5) access to transport and services; (6) the farm; (7) risks, opportunities and storage. Before presenting the income model in the next section, a useful first orientating step is to elaborate some details of the major subject areas covered by the survey.

For each "resident" member (normally living in the household and including guests who have been staying for more than two weeks and share meals) the following details were gathered: relationship to the household head, age, education, literacy, current principal and secondary occupations; for any resident members involved in off-holding seasonal work, the details of who, their dates of departure and return, nature of work and payment and details of any agricultural inputs, school fees and lump sums on their return. The concept of the membership of the household was expanded to include any non-resident persons, spouses, sons, daughters, brothers and sisters, sons-in-law and others, who contribute economically to the household on a regular bais. For these "members" similar details were gathered: their names, relationship to head, age, education and literacy, current principal and secondary occupations, their location, remittances (as per above categories), frequency of visists to the rural homestead and an assessment of their involvement in rural household decisions.

For each of the "resident" members any off-farm wage employment, farm wage labouring (other holdings in Communal Lands) self-employment and estate wage labouring were detailed: experience, qualifications, years of involvement with such work, months and duration of the work, payment, amounts and method, etc.

For each household an assessment of the changes in land and other real assets, financial assets and with access to finance and labour, were detailed. Any land transactions, new buildings and/or improvements to existing buildings, new agricultural machinery and non-agricultural machinery and any bank/savings/post office/building society accounts, borrowing and lending of money by members, loans from co-operative societies, the AFC and other sources were inventoried. Any changes in the primary occupations of members were noted.

Details on farming included land assets, crop production in the 1984/85 season, details on each crop produced, inputs and outputs, cropping pattern changes, family division of labour, crop marketings, quantities, values and outlets in 1984/85 compared with 1983/84, inventory of livestock, patterns of ownership and herd changes over the year 1984/85 and since 1980.

A short section summarily assessed why incomes vary and how household deal with surpluses and shortfalls. Also included were details of grain retention and households assessment of its adequacy.

3. POVERTY AND SECURITY

In this section we examine the different economic activities and their significance as sources of income to the overall aggregate picture of rural incomes. We explain the details of our rural incomes model as derived from the components of our survey of households. Finally, after first looking at each component of income we summarize the aggregate picture of rural incomes. On the basis of a summation of all sources of income, we present an estimation of household income and its distribution.

The rural incomes model

In order to achieve any "synthesis" out of the survey which has generated a data base of over 600 variables for 600 cases, our initial analysis has been to create an estimate of households income. In one sense the exercise of estimating household income is "methodologically outrageous" being based on a single visit survey. As such there are some sections of our income estimates which are more "noisy" while for others we feel more confident. Given, to the best of our knowledge, that there have been no major published surveys of whole farm/non-farm rural incomes, this attempt must be seen as a pioneering effort. Clearly, the model can be improved (from within the surveys own data base and on the basis of a refinement of some of the assumptions adopted.) In another sense , we have to accept that some estimates and the model, in the absence of further research, are the best we have on hand. Let us proceed on the basis that "noisy" models that show up VERY LOUD trends and features are useful.

In most reduced and summary form, the model is made up as follows:

HOUSEHOLD INCOME = SUM (CROP INCOMES + LIVESTOCK INCOMES + REMITTANCE INCOMES + OFF FARM WAGES + LOCAL FARM WAGES + LOCAL SELF EMPLOYMENT + ESTATE FARM WAGES)

HOUSEHOLD INCOME	= Total household income
CROP INCOMES	= Sum of crop incomes from 0-6 crops
LIVESTOCK INCOMES	= Incomes from livestock.
REMITTANCE INCOMES	= Remittances from 0-6 non-resident "members" who contribute economically to the household on a regular basis
LOCAL OFF FARM WAGES	= Local off-farm/non agricultural wage labouring (0-4 members)
LOCAL FARM WAGES	= Local agricultural wage labouring on other Communal Area holdings (0-4 members)
LOCAL SELF EMPLOYMENT	= Local self employment activities (0-4 members)
ESTATE FARM WAGES	= Farm wage labouring on commercial estates and government farms (0-4 members)

On the basis of our survey findings (and model) we have allowed for a theoretical maximum of 29 different sources of income. In practice the vast majority of households have a much lower range of income sources. The survey has shown up some interesting patterns to the clusters of income sources i.e. from narrowly agricultural (just subsistence crops) to highly diversified agricultural incomes in combination with other off-farm/non-farm income sources. This is examined in section 4. Each of the income components is further decomposed into sub-elements as derived from the surveys data components as is briefly described below.

Crop incomes

Crop incomes provides for the possibility of up to 6 crop enterprises made up of various permutations of a total of 19 crops identified. In the majority of cases the cropping patterns at the household level were dominated by various permutations of maize, munga, rapoko, sorghum, cotton, sunflower and groundnuts. On the basis of the cropping patterns at the household level Crop Incomes was generated from up to 6 crop revenues (bags/bales x 85 prices) less associated enterprise crop costs. Each crop cost was calculated on the basis of 8 possible sources of cost: A land preparation cost at one of two levels (where applicable), a cost for seed, a cost for manure (where applicable), a cost for ammonium nitrates, a costs for urea, a cost for compound fertilizers, a cost for chemicals and a costs for hired labour

(family labour was not costed). For the purpose of a disaggregated analysis the crop income was decomposed into its subsistence and marketed components.

Crop incomes have proved to be the single most important source of rural incomes accounting for over 50% of all measured income and affecting 96% of all households as an income source. This single income heading in the model somewhat masks its derivation from approximately 2000 separate crop enterprises. Given our method of costing we estimated only 12 cases of negative crop income (costs exceeded revenues) for the above average season 1984-85.

Given the wide variation in production from year-to-year (basically in response to rainfall), we might expect a much greater proportion of negative incomes in a drought year (assuming costs remain roughly similar). We did not estimate any production costs for the 83-84 drought year. The maximum assessed income from crops for an individual household was $3495 in 84-85. The top 10% of the sample had crop incomes in the range $850-3500 their share and accounted for 43% of all crop income.

The mean crop income was recorded at $365 and the bottom 50% of households accounted for as little as 10% of all crop incomes. This picture suggests a distinction between a large group, say the bottom 25%, whose annual crop incomes amount to the equivalent of 1 months minimum wage for an unskilled agricultural labourer. (this level of crop production failing to provide for their subsistence); and the top 50% who easily provide for an adequate basic subsistence and at the upper end of the distribution a considerable marketable surplus.

Table 3.1 illustrates, that over and above the ecological effects on crop incomes, this pattern of crop income distribution between producers, is replicated at the level of each ecological zone. This confirms the need to explain these differences at the level of the household. A fuller examination of differentiation and security is presented in Section 5.

We have made a measurement of variation in cropping incomes. Given our assessment of its aggregate 50% contribution to all measured income in 1984/85, (above average season) it is sobering too note that crop incomes can fall to 40 or 50% of this level in a severe drought (as in 83/84). (see table 3.2).

Table 3.1: Cereal production and marketings: Whole sample and by ecological zone 1984-85 above average season (91 kg bags) ecozone

	Production			marketings						
	Total bags 91 kg	% of total production	Mean bags 91 kg	Total bags 91 kg	As % of production	Mean bags 91 kg	% HHs not marketing	% HHs marketing	% share top 10%	% share bottom 10%
Whole sample (N=600)	16 134	100.0	27.03	9 690	60.00	16.23	40	60	57.71	2.71
Zone I (N=60)	407	2.52	6.78	10	2.54	0.17	95	5	100.0	n.a
Zone II (N=150)	4 811	29.82	32.73	3 311	68.82	22.52	33	61	53.51	1.81
Zone III (N=150)	6 491	40.27	48.62	4 671	71.90	31.14	19	81	45.0	1.31
Zone IV (N=120)	2 554	15.21	11.47	1 111	45.27	9.26	41	59	40.0	6.41
Zone V (N=120)	1 965	12.18	6.06	587	29.87	4.90	46	54	59.31	3.61

Table 3.2
Cropping pattern - variation in production and marketing of
principal crops (comparison of 1984-85 "above average season"
with 1983-84 "last of three years of drought")

Crops	1984-85		1983-84		1983-84 as %
	Bags/ bales	%	Bags bales	%	of 1984-5

CEREALS

MAIZE Production	11564	86.48	6903	93.33	59.9
Marketings	8451	89.14	4727	94.33	55.9
MUNGA Production	1535	11.48	411	5.56	26.8
Marketings	868	9.15	26	<1	3.0
RAPOKO Production	168	1.20	50	<1	29.8
Marketings	107	<1	6	<1	5.6
SORGHUM Production	105	<1	50	<1	29.8
Marketings	55	<1	29	<1	27.6
TOTAL Production	13372	100.00	7393	100.00	55.3
Marketings	9841	100.00	4759	100.00	50.2

OTHER PRINCIPAL CROPS (marketings = production)

COTTON	593	345	58.2
SUNFLOWER	179	58	32.4
GROUNDNUT	462	85	18.4

Statistics on maize production (the dominant cereal) and rainfall
(fluctuations) show a direct correlation and some sense of the
probability of droughts and their severity. The period 73/74,
through to 80/81, was a sustained period of rainfall abundance
and has perhaps conditioned a false expectation for the 80s.
Meteorological figures for the period 1901-02 through to 1987-88
provides a stronger statistical base for our expectations.
Droughts and dry periods have a high probability of occurrence.

In the drier parts of the country our evidence on maize and
munga, (millet) shows that in drought years production was only
20-40% of the above average year. It is worth observing that the
drought figures were for the last of 3 years of consecutive
drought and as such resources available as inputs into the
forthcoming good year may well have been depressed.

A narrow dependence on crop incomes in the dry parts of the

country clearly mean a considerable uncertainty about income and its likely adequacy in terms of subsistence.

Livestock incomes

Our estimate of livestock income has been calculated on the basis of a valuation of the households current stock holdings. (five categories of cattle and four classes of small stock). The valuation was based on a weighted mean value of various categories of animals as classified under the Cold Storage Commissions Communal Area Cattle Sales records for 1984. This value was adjusted to the various categories of stock at the farm level by livestock unit equivalents. We then assumed an income stream of 5% of the herd valuation. This may appear to be small, however, off-take rates as measured by the official sales records show a range of 2-12%. There is a clear tendency to have higher off-take rates in the drier areas. Our measure is therefore proxy and is not based on a household by household account of transactions in livestock in 1984/85. This alternative method would have more than likely enumerated a post drought reluctance to sell animals i.e. a very seasonally specific situation. (N.B. the commercial beef sector has shown up similar pattern of a drought related beef cycle.)

We do not want to misrepresent the significance and importance of livestock in the rural economy. We should note that many if not the majority of economic benefits of livestock come from having living animals in the mixed farming system. Most livestock outputs re-enter the holding as inputs, eg. as manure and draught power. The growth of the herd converts into an expanded asset.

Contrary to the popular belief that the majority of the cattle are held in the dryer parts of the country our survey suggests the opposite. Sixty five percent of households with 16-50 head of cattle and 58% of households with 8-15 head of cattle were located in agroecological zones 2 and 3 (the more favourable areas). There is a counter trend when one examines the stockless. Forty eight percent of households in Zone 2 were stockless while there was a significantly lower proportion of 30% in Zone 4. This trend is not clear cut for Zone 5 had a figure of 40% for the stockless households.

We have assessed that 44% of all measured livestock income was controlled by the top 10% of cattle and stock owners. The top 25% of stock owners, controlled 74% of all stock and their related incomes (see figure 3.2). The security role of livestock as an asset is well established and there is also a clearly established pattern of compensatory sales of livestock to meet shortfalls in incomes or expenditure requirements. Thus with the recent droughts the official statistics show this compensatory pattern clearly. The ability to do this is limited to only a proportion

Figure 3.1

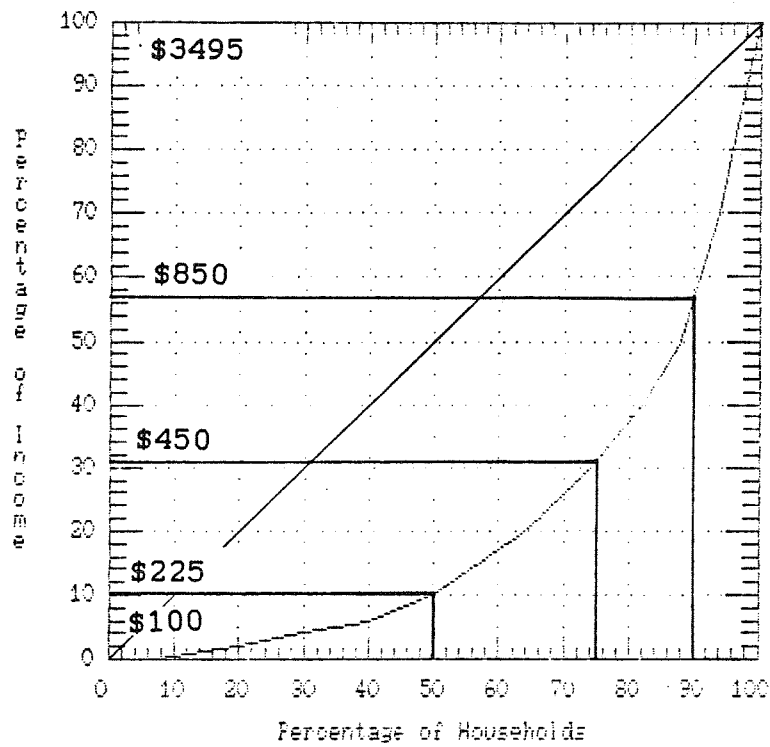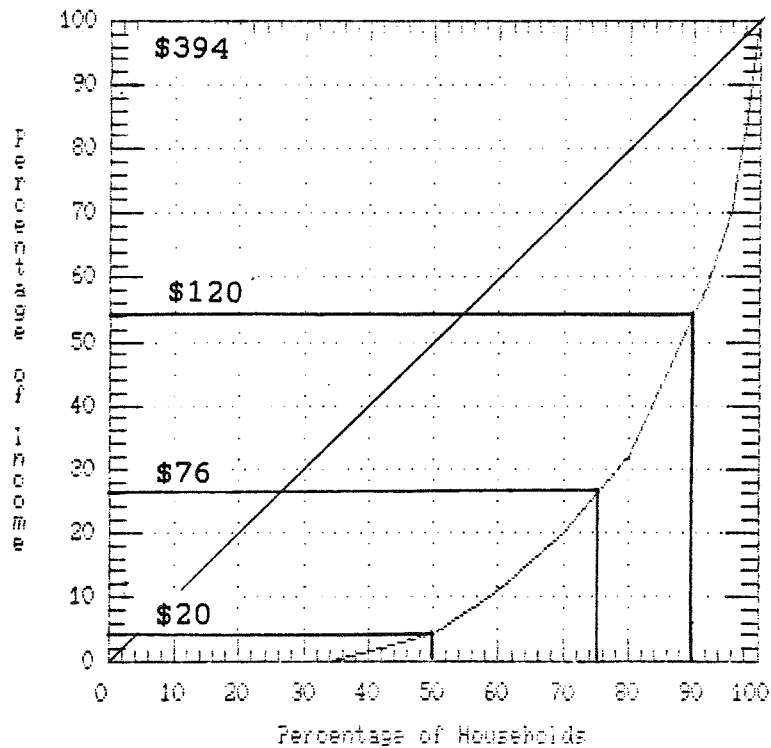## Distribution of Crop Income
(whole sample n=600)

Figure 3.2

Distribution of Livestock Income
(whole sample n=600)

of households. Not only those without animals at all, but many of the marginal stockholders could find themselves stockless or incapacitated with respect to draught power if they were forced into selling their animals. One of the explanations for the low off-take rate, is that as many as 40% of all stock owners are marginal without a basic viable herd. The priority of this group is first and foremost to accumulate more animals at all costs and to avoid any cripling erosion of their marginal herds. At the other end of the scale, households with 30-40 head of cattle, and as many small stock can comfortably sell off two to three animals to realize cash for expenditure needs, including food in the even of a subsistence shortfall.

Remittances

Our analysis shows that 37% of the sample received incomes as remittances. The evidence of remittances was gathered under several headings: cash, food, agricultural inputs, school fees, and "other". The estimate of the cash and food components were computed on the basis of the amount and frequency of these remittances. The level of remittances can clearly vary from month to month, be subject windfall incomes and/or have a strong seasonal dimension. Our estimate is thus potentially quite noisy, based on a recall of the remittance at the last visit. However, our data base shows a consistency in the correlation between the salary or wage of the non-resident person and the recorded level of remittances under various items.

Remittances accounted for 19% of all assessed income. Within the separate categories of remittances, cash was the most important accounting for 51%, food accounted for 32%. The remaining 16% was distributed among the residual categories. This pattern of remittances, as mainly providing for the immediate cash and food needs of the rural homestead, contrasts with a 'somewhat assumed image of migrants remitting inputs for agricultural enterprises. We can confidently expect that agricultural inputs will be a very small proportion of the value of total remittances. None-the-less, as is presented later, there is some evidence of an interaction between the presence of remittance incomes and cropping incomes.

Like many of the income sources we have identified, there is an important distinction between the existence of remittances or not and the significance of these incomes. The levels of remittances vary enormously.

The distribution of remittances is highly skewed. The survey has agonizingly enumerated, at the low income end of the distribution, an estimated total remittance of $1677 distributed over 42 households i.e. approx. $40 per household over a year! At the other end the top 10% of households enumerated as receiving

Figure 3.3
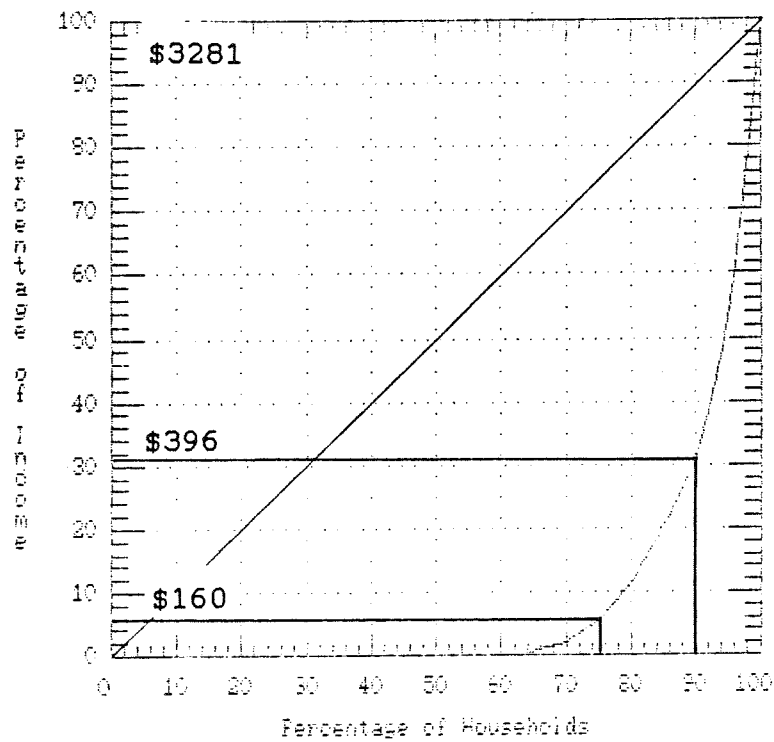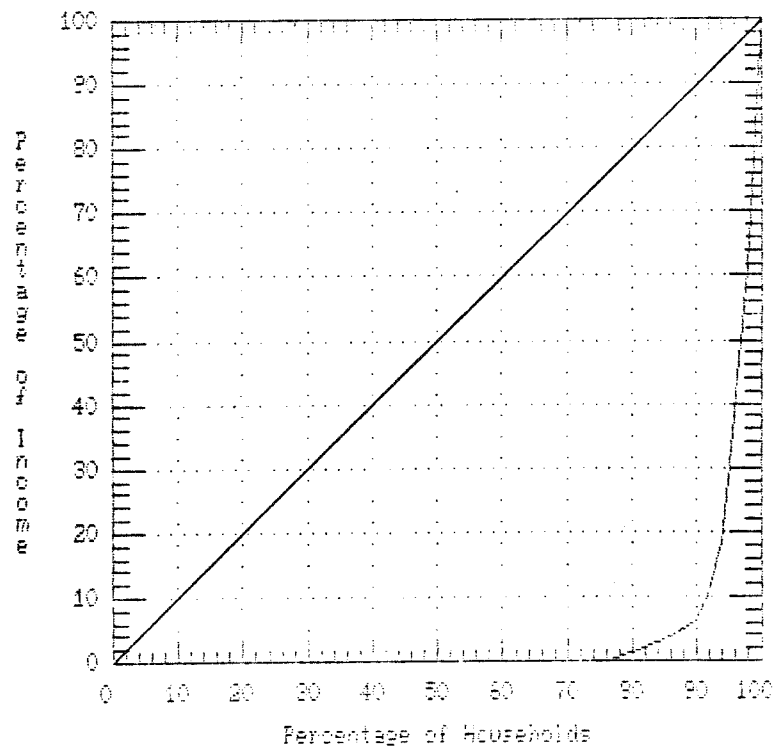
Distribution of Remittances
(whole sample n=600)

Figure 3.4

Distribution of Self-employment Income
(whole sample n=600)

remittances netted a total of $30824, or approximately $500 per household. We should therefore be cautious in dividing our sample into those "with" and "without" remittances and to then compare the means of sub-populations. The comparison of households with $1000+ of remittances and those without might be more useful.

Remittances provide for an income diversification and a strategic income security. For example, during a poor agricultural season we might expect them to be called in to compensate for the shortfalls in rural income including basic subsistence. Our evidence shows that in most cases household incomes are significantly raised by the addition of remittances. Over a period of time this remittance income can provide for an upgrading of the rural resource base and finance higher levels of inputs into agricultural enterprises. These incomes may also provide capital to establish non-farm or self-employment enterprises in the rural areas.

Local off-farm wage labouring (within Communal Areas)

Local off-farm wage labouring has emerged as the third single most important source of rural incomes. The income has been computed on the basis of the stated daily/monthly wage and the associated period of employment. This income source affects 10.7% of all rural households and accounts for 14.7% of all assessed income. In some cases we observed as many as four members within a single household as having this income. This in part, explains a situation where we have quite a significant share of total assessed income is concentrated on a small number of households.

The mean level of income from this source was $960. The distribution shows that this income source was made up of 2 sub groups. One group of households whose off farm wage employment was seasonal or part-time and another much smaller group (the upper 5%) of households whose income from this source represents a full-time wage or salary in the range of $800 to $5352 per annum. The incomes of this latter group will dramatically distinguish these households from others whose incomes are tied closely to crops and livestock. The loss of a job in this situation would be disastrous for the household. As we discussed, in the case of remittances, we might well expect to see in the case of this latter group, a rural tooling up and up-grading of the compliment of endowments and higher levels of inputs into agriculture over time (follow up research analysis of this question is ongoing). A proportion of these households may simply be resident locally because of a presence of a job. Their customary land rights may be located elsewhere. In this situation the income could well be remitted.

Self-employment

Self-employment has emerged as the fourth most important source of income both in terms of the numbers of households with the income source (24.3%) and in terms of its contribution to all assessed income (7.9%). Seven cases received incomes in the range $1 000 to $3 480. The bottom 5% having self-employment incomes enumerated at $20 or less. There are important qualitative difference in self-employment activities which account for the differences in derived incomes. For example, occassional beer brewing versus year-round mechanic services (see figure 3.4).

Estate wage labouring

Some communal areas and households are conveniently located near large state farms or private commercial concerns where they can gain seasonal, daily, piece work or short contracts in agriculture. Six percent of our households recorded incomes from this source. They amounted to 2.5% of all assessed income. The mean income from this source was $295.

Local farm wage labouring

Approximately 13% of our sample reported local farm wages as an income. These incomes were very small and the periods of employment very short. One or two days land preparation or harvesting of crops. As such, this source of income contributed to less than 1% of all assessed income (see fig. 3.5).

The income structure of rural households

Table 3.3 summarizes these components of income as aggregated across the whole sample. It shows the distribution (concentration or spread amongst households) and the relative significance of each sources contribution to the aggregate total income.

Measurement of household income

For each case in our sample, household income represents the summation of incomes from all these potential sources as and when incomes appeared. In aggregate we measured $417580 across 600 HHs. Our mean income per household was $700 and the median was $450 - evidence of the skewness to the distribution of income. Income levels per household have a very wide-ranging distribution. The top 10% of households had incomes in the range $1 467 to $5 394. The bottom 25% had incomes of $225 or less (see Fig. 3.6).

Figure 3.5

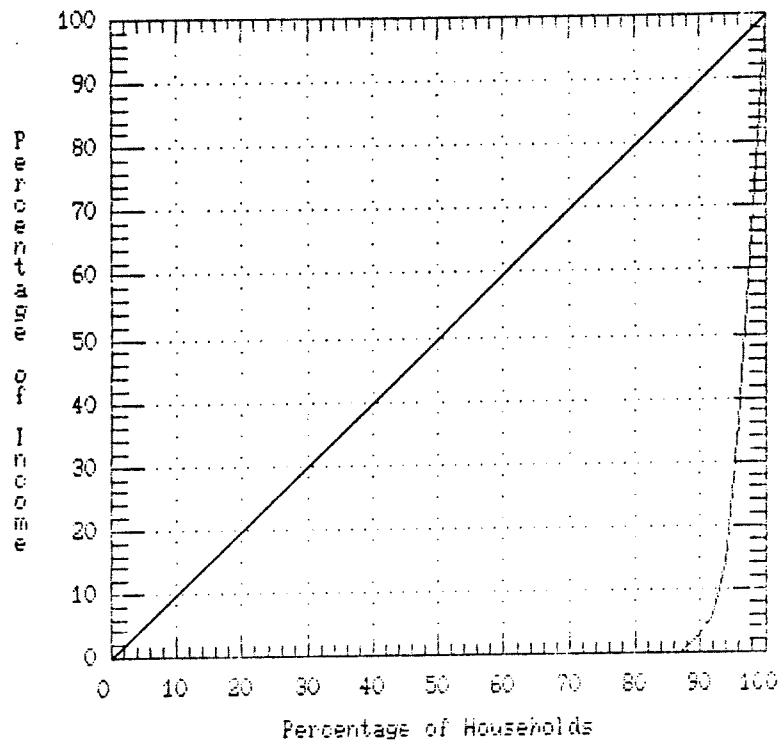### Distribution of Local Farm Wage Income
(whole sample n=600)

Percentage of Households

Figure 3.6

Distribution of Household Income
(whole sample n=600)
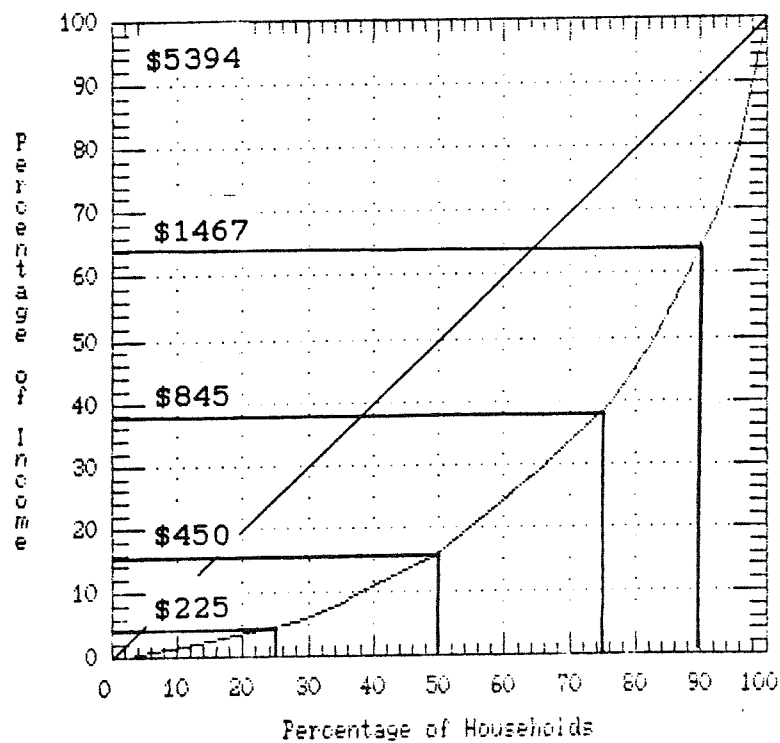

Percentage of Households

Table 3.3
The income structure of rural households
(as derived from the income model and survey components)

Income Source	% HH with source	% of tot. Income	Mean income from source
Crop income	95.83	50.35	365.64
Livestock income	66.83	5.41	56.37
Remittances	37.0	18.51	348.20
Local off-farm wage	10.67	14.71	960.16
Local farm wage	12.8	<1	31.99
Estate wage	6.0	2.5	295.26
Self-employment	23.24	7.88	225.24
Household income		Aggregate mean	700.74

4. LIVING STANDARDS AND DIFFERENTIATION

4.1 Introduction

We now investigate two dimensions of food insecurity, namely poverty and risk. Households which are currently poor are obviously prone to food inadequacy because food consumption is a large component of the peasant budget. However, households differ not only by their current income but by the riskiness of their income: households with the most riskiness are other things being equal, are more likely to encounter periods of food inadequacy. Arranged on these two dimensions of income and risk, those households that are both poor and have typically insecure incomes have the most acute problem of food insecurity. In this section we make an assessment of living standards and risk to identify factors which contribute to poverty and insecurity there by identifying the characteristics of those households with the most acute food security problem.

We should note that household food security is distinct from nutritional adequacy although the two are clearly related. A household with food security is able to command sufficient resources to ensure sustained nutritional adequacy, but the latter may fail to be achieved either because of ignorance of suitable diet or because of mal-distribution of consumption of members. We do not wish to underrate the importance of this mapping from food security into nutritional adequacy, but its investigation lies beyond the scope of our study.

4.2 Measuring living standards and differentiation

The living standard of a household or its member is an illusive and multi-faceted popular concept. At the level of measurements, it is probably best reflected in the magnitude of expenditure.

However, if expenditure persistently exceed income, so that the household is "living beyond its means", the future living standard must be reduced. Income during a period shows that level of expenditure which can be sustained over that period without altering net worth. Actual expenditure may well depart from this level to the extent that decision-takers believe current circumstances to be atypical and have the opportunity to alter their net worth. Indeed, such alterations to net worth are one of the central responses to drought. However, the capacity of the household to alter its net worth is taken up in our analysis of security in section 4 and here we confine our measurement of living standard to income.

We define household income as being the sum of the income categories of section 3 received by the resident members of the household. However, the total income of a household is likely to be a very poor proxy for the living standards of its members, even if we are prepared to abstract from intra-household differences. This is because households differ both in composition and in size.

Before proceeding with our discussion of inequalities and differentiation, it is important to elaborate on our concept of AAEUs (adjususted adult equivalent units) in our assessment of living standards. On the basis of the work of M.C. Latham (1965), the calorie by age and sex as derived for East Africa has been used to assign each household member with his/her appropriate adult equivalent weighing. These weights have been summed over the household to produce a measure of the household adult equivalent units AEUs. The resulting size of households in AEUs has been further adjusted on the basis of Deaton's (1980) assessment of an average cost of a household of a particular size relative to those of a single member household (a household economy of scale factor) - AAEUs. (See Collier et al. 1986 for a fuller elaboration. We have duplicated their approach here).

Our measurements of household incomes had been adjusted by AAEUs. This facilitates a better assessment of living standards and of the overall distribution of income between households by taking account of the household composition. It also provides our assessment of per capita income. The mean per capita income was assessed at $227 and the median income was $137.50. The model measures income for the top 10 per cent range from $450 to $4451 and the bottom 10 per cent has a per capita income of $33 or less. Our sampling procedures set out to proportionately capture a spectrum from rich to poor and the pattern is expected. The degree of inequality is discussed below. The top 10 percent control 41.7 percent of all measured income. The upper half of the sample control 84.6 per cent of all measured income. The bottom 25 percent only controlled 4.3 percent of all measured income. Given the size of our sample and our system of sampling households within the CSO's National Sampling Frame, this assessed distribution is in all likelihood a fair representation

of the wider national situation in the Communal Lands.

Theil (1971) has proposed an inequality measure based on information theory. It is given by $T = \log(n) - SUM [y_i \log(1/y_i)]$ where y_i is the share of aggregate income going to person i and n is the total number of people. Because of its ease of decomposition we have used the Theil index as a measure of inequality. Income per AAEU over households had a Theil value of .343 which is relatively low compared with some other African countries (such as Tanzania and Kenya) on which there is directly comparable data, indicating that inequalities are less pronounced with the peasant sector of Zimbabwe. Nevertheless, a Theil of 0.343 indicates large income differentials.

4.3 Living standards and activity-mixes

Given that living standards differ markedly between households, our next task is to investigate whether these differences are related to the economic activities in which the household is engaged. As in section 3, we distinguish three farm activities, subsistence crops, marketed crops, and livestock. Within non-farm income we distinguish between self-employment, remittances, off-farm wages and agricultural wages. The last of these combines estate employment and working for wages on other peasant farms. Since households may or may not have income from each of these seven sources of income, there are 128 ways in which income sources can be combined. At one extreme, a household might participate in all seven activities, at the other it might be specialised in a single activity (and in the limit have no identified income). We will refer to the combination of activities in which a household is engaged as its activity-mix or its economic stance. It turns out to be an important concept both for the determination of living standards and for income security.

In table 4.1, we show how the 600 households were distributed over these 128 activity-mixes. Households were heavily concentrated in a few of these activity-mixes, six of which accounted for 50 percent of households, and a further 25 percent being accounted for by another ten. Each of the remaining activity-mixes accounted for less than 2 percent of households so that they are both unimportant and, in view of the small cell sizes, not worth examining on our data set. We therefore confine our attention to the 16 major activity-mixes.

Although subsistence crop income was by far the most common activity, being virtually universal (94 percent of households), very few households (5 percent) were confined to this activity. Other than this, only a negligible number of households were confined to any single activity. Not only are households diversified into several activities, but no single mix of

Table 4.1: Households by activity-mix (percentages)

Farm activities	Non-farm activities: No non-farm activities	Remittances only	Off-farm wages only	Farm wages only	Self-emp. only	Remittances with: Off-farm wages	Remittances with: Farm wages emp.	Remittances with: Self-emp. wages	Remittances with: Farm wages and self-emp	Off-farm wages with: Farm wages	Off-farm wages with: Self-emp	Remittances and off-farm wages with: Farm wages	Remittances and off-farm wages with: Self-emp	Farm wages and self-emp. with: Remittances	Farm wages and self-emp. with: Off-farm wages	All non-farm activities	Row %
No farm activities	0.7	0.2	1.3	0.3	0.2	0	0.5	0.2	0	0.2	0	0.2	0	0	0	0	3.3
Without subsistence																	
Livestock only	0.3	0.2	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0
Crops only	0.3	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Livestock and marketed crops	0.7	0.2	0	0.2	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0
With subsistence																	
Subsistence only	5.0	2.8	2.2	2.7	1.2	0	0.2	0.5	0.2	0.3	0.3	0	0.2	0.2	0	0	15.2
Livestock	4.0	2.0	0.8	1.3	2.0	0	0.5	0.8	0.2	0.3	0	0.3	0	0.3	0.2	0	12.5
Marketed crops	4.2	3.7	0.7	1.2	1.8	0.2	0.3	1.3	0.2	0	0	0	0	0	0	0	14.0
Livestock and marketed crops	15.3	15.2	2.3	3.5	5.5	0.5	1.3	4.3	0.3	0.5	2.0	0	1.2	0.5	0	0	52.7
Column per cent	30.5	24.3	7.3	9.2	10.7	0.7	2.3	7.7	0.8	0.8	3.0	0	0.2	0.7	0	0	100.0

activity characterises more than a small proportion of households. The two most common are the combination subsistence, marketed crops, livestock and subsistence and marketed crops and livestock and remittances, but each of these only accounts for 15 percent of the population. The implication of this is that because households differ radically in their economic stance, they may accordingly differ both in income and security and be quite differently susceptible to a given policy. For example, the 5 percent of households dependent only upon subsistence and livestock are likely to be in very different circumstances from the 2 percent dependent upon subsistence and marketed crops and remittances.

Differences in economic stance are likely to be asssociated with differences in income both because they reflect non-labour assets and because returns to labour may differ systematically. As examples of the former part of the income from livestock and self-employment represents returns on the assets accumulated in those activities. Differences in the pure returns to labour between activities can only persist if there are barriers to entry into the more remunerative activities. However, such barriers are likely. For example, off-farm wage employment may require skills or education not possessed by most households, and self-employment may require contacts and experience in some type of business. Remittance receipts require that some past member of the household has been able to acquire an urban income source, usually wage employment, and this probably requires contacts and skills.

To measure the extent to which differences in living standards are related to the economic stance, the Theil index was decomposed into within and between group components. All activity-mixes with less than 2 percent of households were aggregated into a single group, so that the 600 households could belong to one of 17 groups. If all the households within any group have identical living standards, then inter-group differences account for the entire extent of inequality. Conversely, if all groups share the same mean living standard, then equality is entirely attributable to intra-group differences. So arranged, the between group Theil index is 0.170, so that the economic stance accounts for 50 percent of total inequality, differences between households within the same activity-mix accounting for the remaining 50 percent. This demonstrates that the activity-mix is indeed an important aspect of differentiation.

Table 4.2 also reports the mean living standards for each of the 16 main activity-mixes. By far the lowest living standard is experienced by households confined to subsistence agriculture, income per AAEU being $28 p.a. The highest income per AAEU was $771 p.a. This latter group, although spatially part of the rural population, is not in economic terms part of peasant society. It

Table 4.2: Levels and contributions to rural household incomes from farm and non-farm source: The 16 most dominant clusters of economic activities (77.17 percent of all households) and associated per capita levels of cereal production, marketings and storage

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	Income			Total		Non-farm incomes								Numbers		Farm income				Cereals per capita		
	CLUSTERS			HHINCAA		REMITAA		OFWAGEAA		SELFAA		FWAGEAA		CROPSUBAA		CROPMARAA		LIVINGAA		STOR	PROD	MARK
	No.	n =	% HHs	$	%	$	%	$	%	$	%	$	%	$	%	$	%	$	%	-A BAGS	-A BAGS	-A BAGS
	1	95	15.67	140	100	106	38.1							46	32.8	79	56.4	6	4.3	2.7	9.5	6.1
	2	92	15.33	278	100									55	19.8	97	34.9	17	6.1	3.1	11.5	7.6
	3	33	5.50	229	100					54	23.6			51	22.3	110	48.0	11	4.8	2.7	10.3	7.0
	4	30	5.00	28	100									28	100.0					1.8	2.1	0.0
	5	25	4.17	81	100									43	53.1	38	46.9			2.8	6.0	2.4
	6	25	4.17	416	100	160	38.5			114	27.4			46	11.1	83	20.0	11	2.6	2.8	11.3	7.8
	7	24	4.00	55	100									40	72.2			13	27.3	3.3	4.1	0.0
	8	22	3.67	224	100	119	53.1							31	13.8	74	35.2			2.5	10.0	7.2
	9	20	3.33	210	100					80	38.1			45	21.4	74	35.2	11	5.2	2.6	7.5	4.3
	10	17	2.38	142	100	103	72.5							39	27.5					3.5	3.6	0.0
	11	16	2.67	127	100							90	70.9	37	29.1					1.9	2.9	0.0
	12	14	2.33	279	100			129	46.2					54	19.4	78	28.0	15	5.4	2.9	8.6	5.0
	13	14	2.33	771	100			736	95.5					35	4.5					2.9	3.1	0.0
	14	13	2.17	155	100	74	47.7							67	43.2			12	7.7	4.4	4.9	0.0
	15	12	2.00	273	100					114	41.8			42	15.4	83	30.4	11	4.0	2.8	11.1	7.6
	16	12	2.00	94	100					41	43.6			46	48.9			6	6.4	2.4	3.1	0.0

Column No. Index

1. Index number to economic clusters;

2. Number of households in the cluster;

3. Percentage of households in the cluster;

4. Total adjusted per capita income for 1985-86 Zimb.$;

5. Percentage of total income;

6. Remittance income per capita (adjusted) Zimb.$;

7. Percentage of total income from remittances;

8. Off-farm wage income per capita (adjusted) Zimb.$;

9. Percentage of total income from off-farm employment;

10. Self-employment income per capita (adjusted) Zimb.$;

11. Percentage of total income from self-employment;

12. Farm wage employment income per capita (adjusted) Zimb.$;

13. Percentage of total income from wage employment;

14. Subsistence crop income per capita (adjusted) Zimb.$;

15. Percentage of total income crop subsistence crops;

16. Marketed crop income per capita (adjusted) Zimb.$

17. Percentage of total income from marketed crops;

18. Livestock income per capita (adjusted) Zimb.$;

19. Percentage of total income from livestock;

20. Bags, cereal (91kg) stored per capita;

21. Bags, cereals (91kg) produced per capita (adjusted) 1985-86;

22. Bags, cereals (91kg) marketed per capita (adjusted) 1985-86;

Guide to income clusters

1. Subsistence and marketed crops and livestock;

2. Subsistence and marketed crops and livestock and remittances;

3. Subsistence and marketed crops and livestock and self-employment;

4. Subsistence;

5. Subsistence and marketed crops;

6. Subsistence and marketed crops and livestock and remittances and self-employment;

7. Subsistence and livestock;

8. Subsistence and marketed crops and remittances;

9. Subsistence and marketed crops and livestock and estates and/or farm wage labouring;

10. Subsistence and remittances;

11. Subsistence and estates and/or farm-wage labouring;

12. Subsistence and marketed crops and livestock and off-farm wage labour;

13. Subsistence and off-farm wage labouring;

14. Subsistence and livestock and remittances;

15. Subsistence and marketed crops and livestock and self-employment and estate and/or farm wage labour;

16. Subsistence and livestock and self-employment;

is not composed of peasants who have made good but rather of an elite which has been metaphorically parachuted into the economy, the characteristic representative being the school teacher. This group apart, the other activity-mixes all represent stances achieved by peasant households. Since the market for crops and labour are relatively recent developments in Zimbabwe, largely having come into being during the course of this century, those households engaged in activities other than subsistence crops and livestock have in a sense progressed to them from these core, or original activities.

4.4 The accumulation of activities

Consider this accumulation of activities starting from pure subsistence crop cultivation. We lose little by ignoring the possibility of the simultaneous adoption of more than one activity, so that a household may add only one activity at a time. The pure subsistence household may therefore diversify into any of the six other activities which define table 4.1. Similarly, households which for example, adopt livestock, may then go on to adopt one of the remaining five activities. Between the pure subsistence stance and participation in all seven activities, there are 720 possible paths of activity accumulation (6!) We have seen that to a considerable extent higher living standards must have been associated with a process of activity accumulation rather than with augmented income within a given activity mix: this is why so much inequality is attributable to the economic stance of the household. Of course, peasant households experience reverses in economic fortune, and this can be expected to give rise to activity decumulation on the part of some households. Hence, the 720 routes between subsistence and the fully diversified households are not one-way streets.

Figure 4.1 depicts schematically the possible stages between subsistence and the fully diversified household. Although there are 720 "routes" between these two end points, there are only 64 activity-mixes. Potentially, households may be strung out along this entire process, some households being found in each of the 64 activity-mixes and some being in transition along each of the 192 paths. The problems which confront (say) the subsistence and remittance household attempting to enter livestock are liable to be quite different from those confronting the subsistence and self-employment and marketed crops household attempting to enter off-farm wage employment. This gives rise to a potential research agenda which is highly disaggregated. Fortunately, most of the activity-mixes are, as we have seen, not applicable in many cases analyses). We can also infer from the current distribution over activity-mixes that to date only a few of the 192 paths have been followed, and this serves as a guide to where our attention should be focused.

In figure 4.2, the tree structure of 4.1 is applied to the data

Figure 4.1
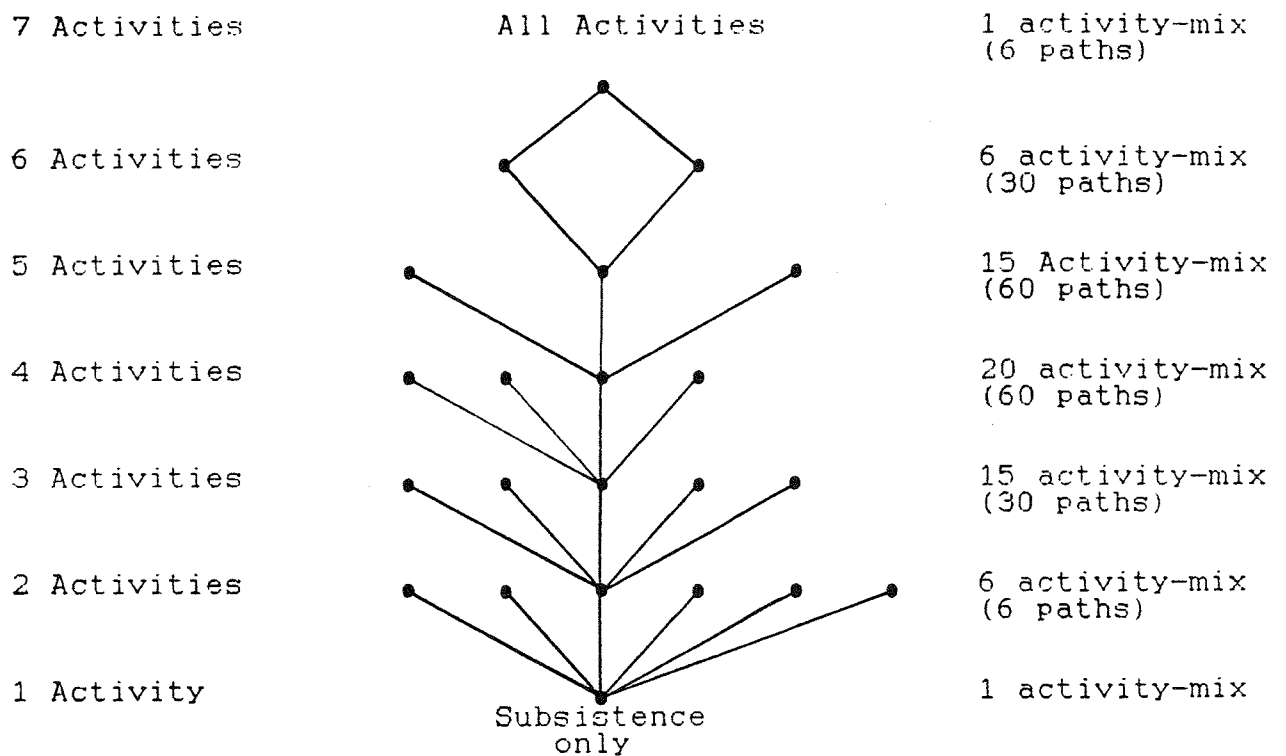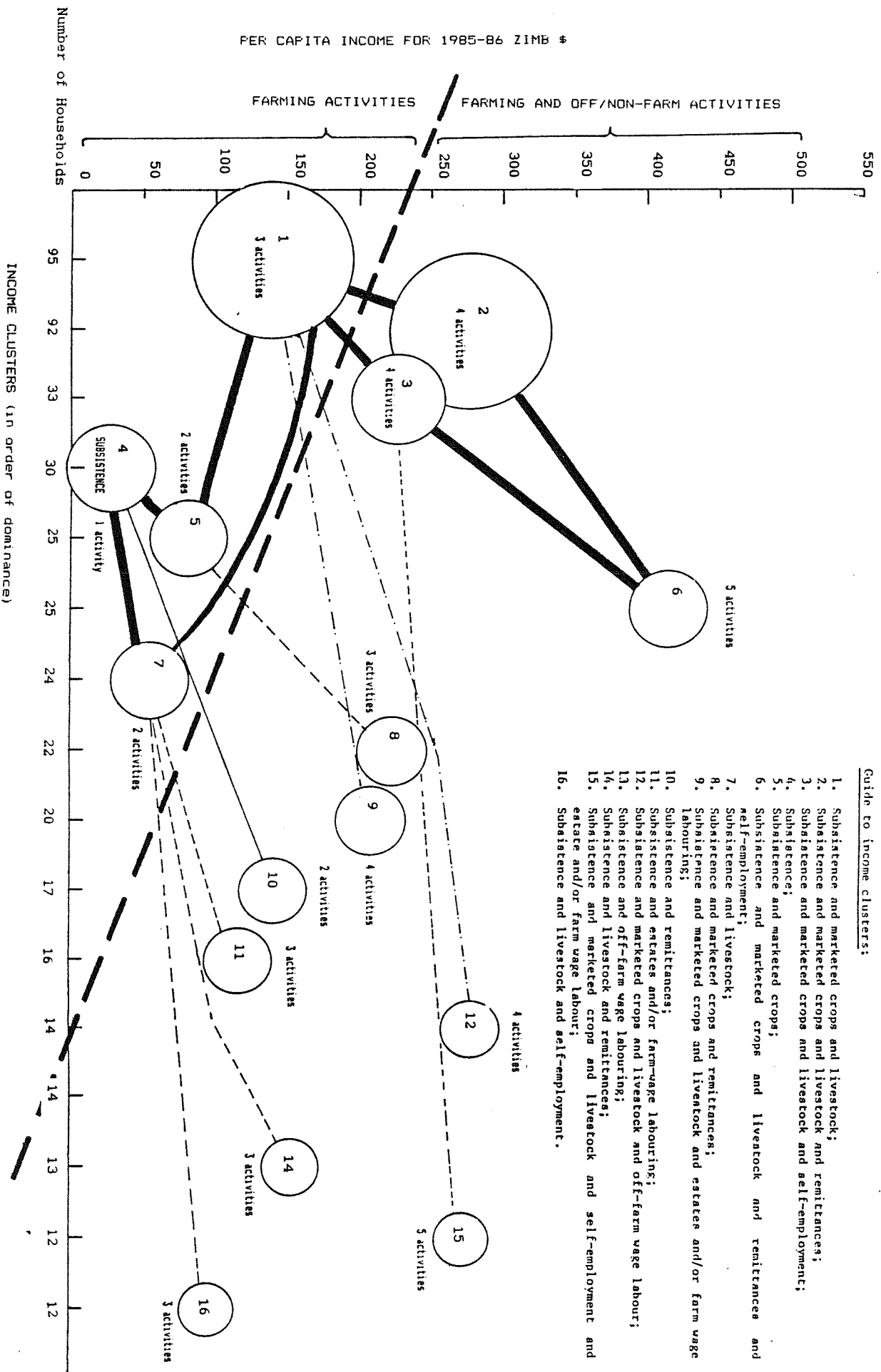
TREE ACTIVITY OF ACCUMULATION

7 Activities	All Activities	1 activity-mix (6 paths)
6 Activities		6 activity-mix (30 paths)
5 Activities		15 Activity-mix (60 paths)
4 Activities		20 activity-mix (60 paths)
3 Activities		15 activity-mix (30 paths)
2 Activities		6 activity-mix (6 paths)
1 Activity	Subsistence only	1 activity-mix

FIGURE 4.2

THE ACCUMULATION OF ACTIVITIES
(Y axis measures income in AAEU and X locates income clusters in
their order of dominance)

PER CAPITA INCOME FOR 1985-86 ZIMB $

FARMING ACTIVITIES   FARMING AND OFF/NON-FARM ACTIVITIES

Number of Households

INCOME CLUSTERS (in order of dominance)

Guide to income clusters:

1. Subsistence and marketed crops and livestock;
2. Subsistence and marketed crops and livestock and remittances;
3. Subsistence and marketed crops and livestock and self-employment;
4. Subsistence;
5. Subsistence and marketed crops;
6. Subsistence and marketed crops and livestock and remittances and self-employment;
7. Subsistence and livestock;
8. Subsistence and marketed crops and remittances;
9. Subsistence and marketed crops and livestock and estates and/or farm wage labouring;
10. Subsistence and remittances;
11. Subsistence and estates and/or farm-wage labouring;
12. Subsistence and marketed crops and livestock and off-farm wage labour;
13. Subsistence and off-farm wage labouring;
14. Subsistence and livestock and remittances;
15. Subsistence and marketed crops and livestock and remittances;
16. Subsistence and livestock and self-employment.

of table 4.1 the analysis is confined to those activity-mixes with at least 2% of the households. The vertical axis is, unlike the figure 4.1, used to measure income per AAEU. As noted previously, pure subsistence offers the lowest income ($32). Of the six possible activity accumulations from pure subsistence, only three appear to have been common in that we find that currently a significant number of households are engaged in them. Of these, the moves into livestock and into marketed crops are the most important. The former appears to raise income from $32 to $72 and the latter to raise it to $104. The third path out of subsistence is into remittances and raises incomes rather more substantially to $155.

Most households have progressed beyond these activity mixes. From the combination subsistence and livestock, there are five possible activity accumulations, but only three appear to have been at all common and one is dominant. To dispose of the minor paths, the addition of self employment raises income from $72 to $101, whereas the addition of remittances raises it to $165. The dominant incremental activity is marketed crops, which raises income to $174. We infer that this is the dominant path out of subsistence and livestock in that currently far more househodls have this economic stance (15 percent) than in either subsistence and livestock and remittances (2 percent) or subsistence and livestock and self employment (2 percent). Unless households pass beyond these activity-mixes at very different rates, the proportion of households currently in them gives some guide as to the relative incidence of their adoption. One important qualification to this is that the activity-mix subsistence and livestock and marketed crops need not be arrived at solely along the path from subsistence and livestock. The alternate path, namely from subsistence and marketed crops may be equally important in that as many households are currently engaged in it as in subsistence and livestock. However, even allowing for this it seems probable that more households move on from subsistence and livestock along the path to marketed crops than to either remittances of self employment.

A similar inference can be made regarding the accumulation of activities from subsistence and marketed crops. Only two of the five possible routes are common, the path to remittances which raises income from $105 to $268 and that to livestock which as we have seen, rises income to $174. By the same reasoning, the latter appears far more important.

From the stance of all farm activities (i.e. subsistence and livestock and marketed crops), four incremental activities are possible and all appear to have been of some significance. We consider them in ascending order of importance on the criterion of the size of the population currently at the other end of each path. The move into off-farm wage employment raises income from $174 to $312 and that into farm wage employment raises it to $477. However, these two activity-mixes together only account for

as many households as are engaged in all farm activities and self employment. The latter raises income to $254. The remaining path into remittances, is more common than all of the previous three activity-mixes together and raises income to $321. Finally, consider the move from four to five activities, from all farm activities, namely into farm wage employment. This raises income from $312 to $373. From all farm activities and self-employment the only path of significance is that to remittances. This raises income from $254 to $463. From all farm activities and remittances the only ssignificant path is to self-employment. This raises income from $321 to $463. [NB. The figures above are values per ´adult equivalent unit´ while the figures in Table 4.2 have been further adjusted for a household economy of scale factor. This accounts for the slight discrepancies between the two sets of figures].

We have now described 15 paths each involving the increment of an activity and each generated on the criterion that at both ends of the path there were at least 2 percent of households in the sample.

Between stances the paths identify various routes leading from pure subsistence cropping to a maximum of five combined activitiers. (In this analysis we have ignored a very small number of households having six or seven activities). A striking feature of these 15 paths is that in each case the addition of an activity leads to an increase in mean income. The likelihood of this being the result of chance is obviously extremely small (0.5 raised to the power 15), so it must indicate a functional relationship between the addition of activities and the enhancements of income. This relationship is quite contrary to the fundamental Smithian notion of "specialization and the division of labour" by which the concentration of labour on single activity enhances income. In the peasant agriculture of Zimbabwe, it is diversification and the versatility of household labour which appears to raise income. This contrast should not be overstated, because the accumulation of activities can also be interpreted as the diversion of labour out of the least remunerative activity, namely subsistence cropping. We are not claiming that the diversified household achieves a higher income than if it were engaged solely in one of the other six activities though in practice very few households are so engaged. However, taken in conjunction with out previous result that differences between activity-mixes account for a sizeable proportion of overall inequality, it suggests that the transition into the non-subsistence activities is a central aspect of the escape from rural poverty. It therefore raises the question as to the identification of the constraints which inhibit some households from making this progression yet which are overcome by others.

5. INCOME AND FOOD SECURITY

Table 5.1 and Figure 5.1 summarise the aggregate per capita
picture of our rural income distribution findings. In this
section we summarise some of the broad trends in sources and
levels of income and examine the importance of diversification in
an analysis and explanation of food and income insecurity.

We might expect households with narrowly based incomes to be more
insecure in the sense that any influence on the income source(s)
would potentially affect the overall household income, more so
than in a more highly diversified income situation. Furthermore,
greater dependence on agricultural incomes given our evidence on
likely yearly variations, could be associated with comparatively
greater variations in incomes. (These two assertions are mediated
by a range of scales of activity and differing productivities
within any one type of activity both between the various
households and economic actors.) We would then expect that a
subsistence-only group might have absolutely lower and
proportionately more variable income than a household that is
diversified agriculturally and has various sources of non-farm
income. On the basis of the disaggregation into income clusters,
our analysis has proceeded to look at the levels and
contributions of the income sources to household income for each
of the 16 most dominant clusters. The measures of incomes and
some other parameters on cereal production marketings and
retention have ben adjusted by our concept of .AAEUs. This
provides for identification of the "poor" and "insecure" in terms
of levels of income and insecurity in terms of narrowness of the
income base, especially so in narrow agriculturally based
incomes.

5.1 Some broad overall trends

Where non-farm incomes are present they can dwarf or be as
significant as farm income. For example, remittances accounted
·for 38.1, 38,5, 53.1, 72,5, 47,7 percent of estimated household
per capita income (income clusters 2,6,8,10 and 14); off-farm
wages accounted for 46.2 and 95.5 percent in income clusters 12
and 13; self-employment accounted for 23.6, 27.4, 38,1. 41.8 and
43.6 percent in income clusters 3, 6, 9, 15 and 16; farm wage
labouring accounted for 70.9 percent in income cluster 11.

The converse being that households whose incomes are based solely
on agriculture tend to have lower incomes. The 30 households
identified as having only a subsistence source of income had a
mean per capita income of $28, the 24 households combined
subsistence with livestock incomes had mean per capita income of
$55; the 94 households identified as having subsistence marketed
crops and livestock incomes had a per capita income of $144. The
principle of increasing incomes with increasing diversity of
sources of income would seem to apply equally

Table 5.1

Pattern of Income Distribution
(as derived from rural incomes model)

Household income
Adjusted Adult Equivalent Units

$$\frac{HHINC}{AAEU} = HHINCAA$$

Cumulative % of Households	Income at Percentile point HHINCAA $	Cumulative % of HHINCAA
10	33.17	0.09
20	57.17	2.90
25	70.39	4.29
30	84.64	6.03
40	105.59	10.30
50	137.50	15.59
60	170.18	22.39
70	218.43	31.12
75	248.08	41.95
90	464.27	58.28

NB. Only 18 households had percapita incomes of $1000 or more

Figure 5.1
Pattern of Income Distribution
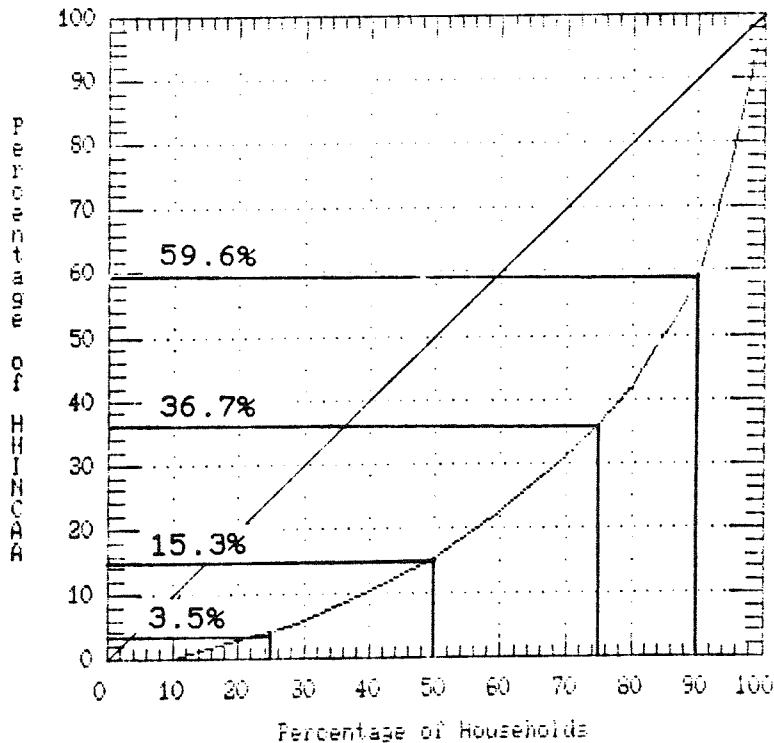
within the agriculture-only clusters.

There is an "additive" and "interactive" affect in an
economically diversified combination of farm and non-farm
activities. A closer look at our two dominant and stereotuypical
household types (ie subsistence, livestock and marketed crops [95
households) and the same three activities plus and marketed
remittances [94 households]) provides clear support for the
"class" stratification across the rural/urban divide. The
presence/absence of the remittance factor would seem to account
for a twofold difference in per capita incomes and evidence of a
significant interaction with the agricultural component of total
rural income, farm incomes in households with remittance being
1.33 times higher (in contribution to per capita incomes) than in
households not currently receiving any remittances.

The full picture of the levels and contributions to rural
household incomes from farm and non-farm sources is presented in
table 4.2. The associated per capita levels of cereal production,
marketings and storage are discussed below.

The fluidity and instability of non-farm sources of income is a
potential source of income insecurity, a loss of a job or source
of income could have a major impact on overall household income.
Moreover, our analysis has unrealistically assumed that all
incomes are pooled equitably among household members, ie while
off-farm incomes can dominate some household incomes, they may be
controlled by a single or few non-resident members. In this
situation insecurity could be a function not only of a narrow
source of income and its variability, but also directly related
to the distribution of that income within the household. This is
the issue of household control and decision-making about the use
of individual members' income.

With respect to narrowly based agricultural incomes, our study
has yielded an illuminating analysis in the variation in crop
incomes on the basis of a comparison of the 1984-85 above average
season with the 1983-84 drought. This evidence is presented in
table 3.2. For the whole sample of all ecological zones the
analysis by crops shows that the ratio of cereal production in
1983-84 to 1984-85 was 55.7 percent. Maize dominated cereal
production accounting for 86.5 percent of all cereal production
in 1984-85 and 93.4 percent in 1983-84. Millet accounted for 11.5
percent of all cereal production in 1984-85 and 5.6 percent in
1983-84. The perfomance of the three principal cash crops shows
up a marked overall crop specific variability. Cotton was the
most robust experiencing a ratio of variation of 58.2 percent.
Sunflower suffered a 32.4 percent variation and ground-nuts fared
worse with drought-year production achieving only 18.4 percent of
the following above-average year.

Subject to the configuration of cropping pattern at the farm
level, some broad sense of variation in cropping incomes can be

assessed. This whole sample aggregation has subsumed important
agro-ecological effects on cropping patterns, production levels
and variability. While maize was grown across all five zones, the
vast bulk of production took place in zones 2 & 3. Variation in
production between years shows a clear increasing trend of
greater variability across the ecological gradient. In the two
dry zones, maize had a higher level of variation than munga
(millet).

Table 5.2 and 5.3 and figures 5.2 and 5.3 illustrate the degree
of differentiation and distribution of cereal production and
marketings within the sample. While there are ecological effects,
variation in production between households accounts for a large
proportion of the total variation. Figure 5.2 shows that the top
10 percent of households controlled 40.4 percent of all cereal
production. The top 25 percent controlled 63.3 percent while the
bottom 25 percent controlled as little as 3.5 percent of all
production. The distribution of marketed cereals is much more
highly skewed. The top 10 percent of households controlled 83
percent of the marketings, 40 percent marketed no cereals. In the
1983-84 season the number of households not marketing cereals
increased to 65 percent of the total sample. We have confirmed
earlier that this pattern of distribution of control of
production and marketings of cereals is replicated across the
ecological zones. While the percentage share varies across the
zones, the top 10 percent tend to control more than 40 percent of
the marketings and the bottom 10 percent involved in marketings
control from 1-6.5 percent of the total marketings.

Figure 5.4 presents an assessment of the adequacy of the
retentions and subsistence production of the non-marketing
households for the above-average 1984-85 season. The scatter plot
is calibrated by three levels of calories per capita per day and
converted to dollars per annum. Level A (2374 cals.) is the
computed mean level of calories per capita per day for the
households that marketed cereals in the sample. According to the
World Bank, nutritional sector study guide lines level B (1600
cals.), they are thus retaining approximately 150 percent of an
estimate of the households' requirements for a year, i.e.
subsistence plus a security. Should total production fall to only
50 percent subsistence requirements in the following year, they
would still be adequately provisioned for the following year.

The number of plots of households below level B indicates various
degrees of inadequacy of provision of basic staple cereals. At
level C, we have identified 52 households (9 per cent of
households with crop incomes) whose subsistence provision is less
than six months supply if consumed at 1,600 calories per capita
per day.

Table 5.2

Household distribution of cereal production 1984-85
(above average season)

Cumulative % households	Production of cereals (91 kg bags)	Cumulative % of production
10	1.18	0.40
20	3.48	2.60
25	3.92	3.50
30	4.82	5.20
40	6.63	10.00
50	7.83	15.30
60	9.75	22.00.
70	11.75	30.60
75	13.12	36.70
80	14.59	43.40
90	17.81	59.60

Total production was 16,134 bags (all cereals).

Figure 5.2
Pattern of cereal production.
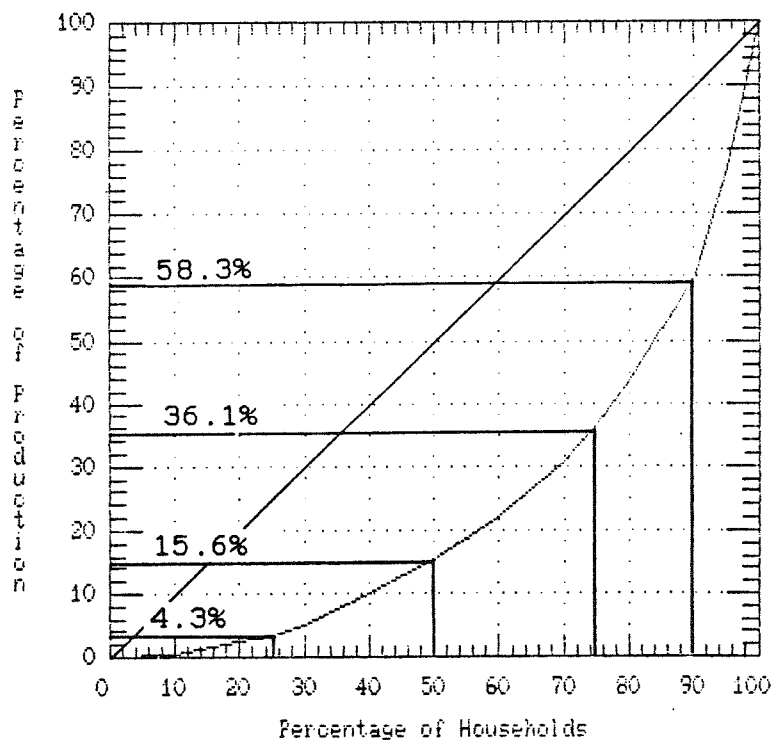
Table 5.3

Household distribution of cereal marketing 1984-85
(above average season)

Cumulative % households	Marketing of cereals (91 kg bags)	Cumulative % of marketings
0-40	0	0
50	2.52	0.051
60	4.47	5.81
70	6.84	12.71
75	7.86	17.03
80	9.77	24.29
90	14.41	43.21

Total marketings were 9.690 bags (all cereals)

Figure 5.3
Pattern of cereal marketings.
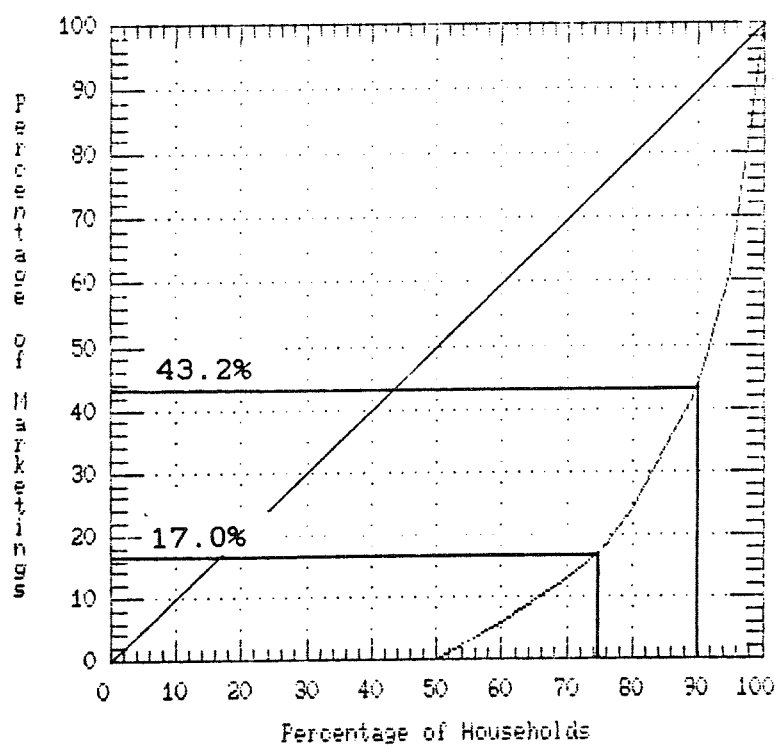
Figure 5.3

Figure 5.4
Scattergram
Value of Subsistence
($ per adjusted adult equivalent unit)
Cereal retentions 1984/85
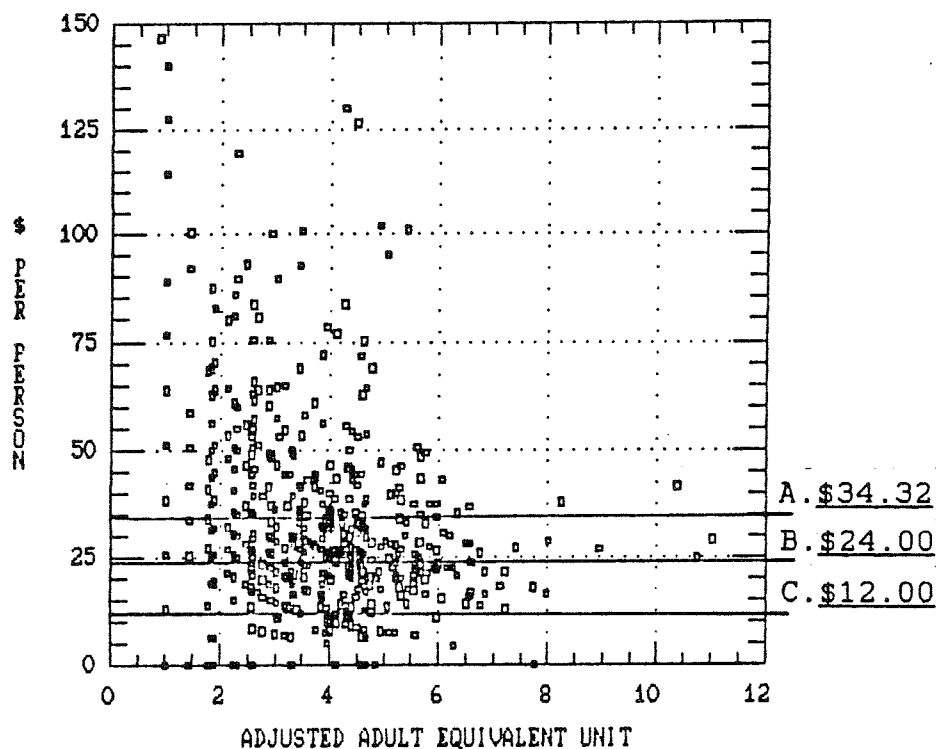
N.B.: Value for Zimbabwean cereals of maize, millet and sorghum is 3,450 calories per kg and $0.14/kg.

A.$34.32 is the mean per capita provision of cereal marketing households, and is equivalent to 2,374 cals/AAEU/day.

B.$24.00 is the World Bank nutritional sector guide-lines for daily per capita calories from staple cereal and is estimated at 1,600 calories per capita per day.

C.$12.00 is less than 6 months retentions if consumed at 1,600 calories per day.

Bearing in mind the variation in crop production outlined earlier, it is clear that in poor or below-average season the numbers who fall below this line will be larger. This analysis is incomplete; however, we have assembled sufficient evidence elsewhere to suggest that these deficit subsistence households are among the poorer income groups and are more narrowly dependent upon agricultural incomes. For example, they may not have access to other income sources to supplement this subsistence shortfall. Our income distribution findings based on the model of rural incomes points to a situation of quite markted rural inequalities within the communal areas of Zimbabwe. Income levels are affected by the level of diversification of income between farm and non-farm sources. Narrowly based agricultural incomes are often associated with the lowest, most variable and insecure household incomes. The distribution of control of both cereal production and marketings highlight a situation of both surplus and deficit households in each locality. In a wider public situation where we only monitor marketed surpluses, we can easily slide into the false impression that a rural areas are on the whole tending to be self-sufficient in food. Extrapolating from our sample survey we might expect to be able to identify as many as 72,000 communal area households capable of provisioning themselves with less than a half-year's supply of staple cereals even during above-average seasons. A significant proportion of these households have no access or opportunity to fall back on to off-farm sources of income to supplement the subsistence shorfalls.

5.2 Diversification of income

In section 4, we found that the diversification of income from multiple activities was central in explaining differences in the level of income. Here we are concerned not with the level of income but with its security, still diversification remains a central concept. For a given level of income, a household is more secure the more its income is derived from a range of independent sources, hence, the criterion of income disaggregation becomes that the risk of income fluctuation from a source should be independent of that in other sources. This is a different criterion from that adopted in our previous diaggregation of income, for there were concerned with entry barriers. Thus components of income with independent risks but common barriers were combined. For example, if a household receives remittances from two different migrants, then the risks of termination of each remittance flow are largely unrelated: the factors which might jeopardise a remittance are largely specific to the circumstances of each particular migrant, and the fortunes of different migrants are unlikely to be closely linked. Hence, whereas from the viewpoint of entry barriers, the remittances received from two migrants can be aggregated. From the viewpoint of security, they should be treated as distinct. The same applies to wage income (whether farm estate or non-farm), for each earner

carries distinct risks of income fluctuation. Similarly, each business income and each crop is distinct. Livestock income is more problematic: potentially each animal could be treated as a distinct source of income on the grounds that the risk of income loss, which is dependent upon the health state of the animal is largely animal-specific. However, many of the disease risks of animals are communicated through the household's herd. We therefore treat the livestock herd as a single aggregate as we do a particular crop, although recognising that just as a crop is made up of many plants with somewhat independent survival chances, so a herd is made up of animals.

So disaggregated we distinguish between 29 distinct components of income. We define the fully risk-diversified household as having its income equally derived from each of these sources and use the Theil index to measure the extent of concentration of income within each household upon a narrow range of components. Thus, the fully diversified household will have a Theil index of zero, while all households dependent exclusively upon a single source will have a theil index of 1.462 (i.e. log 10 of 29). However, the 29 different components of income cannot be regarded as having entirely independent risks. For example, a drought is likely to affect all crops to some extent, and an urban recession increases the risk of dismissal in all urban wage jobs. Hence, we reaggregate the 29 components into the seven broader income components and investigate how much of the income concentration is accounted for within as opposed to between these groups. We might expect, for example, that a household with three income components would be safer if these were each from different groups than all from the same groups, ceteris paribus. The above case for diversification must be qualified because some activities are more risky than others.

5.3   The measurement and explanation of insecurity

It is particularly difficult to measure insecurity. Conceptually, it is quite distinct from current poverty: the insecure are those with a high risk of becoming poor in future, or who have periodically fallen into poverty in the past, regardless of their current income. It is of course possible to identify households with characteristics which might reasonably be thought to cause insecurity, which has been our approach so far, but the direct identification of the insecure requires time series data from which household histories can be constructed. Such data is at present virtually non-existent for Africa because of its resource costs. Our survey was not able to gather multi-year income data; however, it did identify one useful indicator of insecurity, namely, whether the household had been in receipt of government famine relief during the 1983 drought. The distribution of food aid during the drought was based on a reasonably informed attempt to identify the genuinely needy. Thus, at least for one previous year we have a tolerable identification of the insecure.

Approximately 40 per cent of the households in our sample had received food aid, so that we have two large groups (recipients and non-recipients) which provides a good basis for a statistical analysis. Since our measure of insecurity is discrete rather than continuous, conventional regression analysis is inappropriate, and we use logit techniques to identify those characteristics which explain insecurity.

Three types of explanatory variables were used as likely to contribute to insecurity; access to assets, the structure of income and the level of income. It must be borne in mind that each of these is being observed ex post the occurence (or non-occurrence) of insecurity. The hypothesis motivating the analysis is that these variables may generally have returned to around their pre-1983 long-run values and so offer some guide as to the economic characteristics of the household prior to the drought. However, it must be admitted that an entirely different causal interpretation of the results is possible, namely that the experience of insecurity in 1983 (as measured by the take-up of food aid), has caused the economic characteristics observed in our survey.

Access to assets might be expected to increase security since at times when income is low, assets can be depleted. Our survey identified three distinct lines of access, the take-up of credit, the possession of financial savings and the ownership of livestock. The two former were measured only as discrete variables, since the ammount of credit or savings involved was not used. However, in each case around a quarter of the sample had access to the asset. It might seem curious to regard the take-up of credit as similar to the possession of an asset, since it is, of course, the incurring of a debt. However, typically, access to credit is rationed so that the take-up of credit indicates not so much need as credit worthiness.

We measure the structure of income in two ways. First, we measure how widely income is diversified across different sources and household members. As discussed in the previous section, the earnings of each household member from each type of income are treated as an observation, and a Theil index constructed for each household as an indicator of how concentrated the household income is: maximum concentration would thus be, if there is only a single member who has an income from a single source. The extent to which income is concentrated is then decomposed into that which is due to concentration types of incomes and that due to concentration among household members. Variable B shows the proportion of total concentration accounted for by concentration among income sources. For example, for a household with only one earner who derived income equally from each of our major income sources, B would be zero. On average in the sample around half of total concentration was so accounted. The second way in which the structure of income was measured was to include dummy variables for the major income components which took the value of unity if

income from that source was non-zero.

The level of income was measured as previously as income per adult equivalent adjusted for household economies of scale. A final variable included in the analysis was the current level of food sttorage per capita. Unlike the other variables, this is much more likely to reflect a response to the experience of the household during the drought than capturing storage behaviour prior to the drought.

The result of the core logit are set out below:

$$A = -1.35-1.80c -0.075S -0.44L -1.16T +5.43B -0.30Y +0.13F$$
$$(1.18)\ (0.38)\ (0.29)\ (0.14)\ (0.85)\ (1.19)\ (0.36)\ (0.07)$$

chi-square = 71.83

where C = dummy for take-up credit
       S = dummy for financial savings
       L = livestock value in ´000 Zim$
       T = Theil of concentration of income
       B = share of Theil due to concentration among activities
       Y = income per household member adjusted for scale
           economies
       F = food storage per household member
       A = ln (p/(1-p)), where p = the propensity to have been
           in receipt famine relief in 1983

The three asset variables all have the expected negative sign, that is access to assets reduces the propensity to be dependent upon food aid. Access to credit and the value of livestock are both highly significant. For the otherwise representative household, access to credit reduces the propensity to resort to food aid from 0.38 to 0.09, whereas the typical ownership of livestock (more precisely, the mean value of livestock among those with non-zero ownership) compared with zero livestock reduces the propensity from 0.38 to 0.27. Of course, the precise values of these effects are to be treated with great caution, but the general message that asset ownership substantially reduces insecurity seems quite robust.

The structure of income has less clear effects. The overall Theil index was not significant, but the proportion of income concentration due to concentration among activities was highly significant: the more was concentration due to specialization in activities, the greater was the risk of resorting to food aid. Taking the two extremes of all income concentration being due to specialization in a single activity, versus income being spread evenly across all activities, the propensity to resort to food aid rose massively from 0.38 to virtually unity. Recall from our previous study of activity-mixes that virtually all households grow subsistence food, so that concentration on a single activity in practice means being confined to this activity. This suggests

that those whose only economic activity is subsistence are radically more vulnerable to famine. We investigated this further by incorporating dummy variables for the major components of income. One source showed up as being particularly significant and powerful in reducing the resort to food aid, namely access to remittances. The otherwise representative household reduced its propensity to use food aid from 0.38 to only 0.16 if it was receiving remittances. This suggests that having urban wage earners as part of the extended family is a highly successsful means by which households increase their security.

The coefficient on current income, Y, was nonsignificant. Even had it been significant, it implied only a very modest effect. Were the otherwise representative household to have its current income doubled, the propensity to resort to food aid would be reduced only from 0.38 to 0.36. We must be careful in placing too much weight upon this result since the measurement of income is, as we have stressed, difficult. However, to the extent that we have overcome measurement problems, the result suggests that the problem of insecurity is rather distinct from the problem of current poverty. Those most prone to a collapse into acute hunger from which they were rescued by food aid are not especially the currently low-income households, but rather those with little access to assets and with a narrow range of income sources.

The final variable, the quantity of food currently in storage per household member, is not significant at the 5 per cent level, but is significant at the 10 per cent level. We have suggested that for this variable it is more credible to reverse casuality: the experience of famine should induce the household to be more defensive and thus to store more food. This is indeed supported by the results. Compared with the representative household, a household with double propensity to have resorted to food aid in 1983, and with all its characteristics other than food stored the same as the representative household, now stores an additional 13 kilos per household member. This suggests that the unusually severe drought of 1983 did change peoples' expectations of future risks, and change them most for those households who were in most danger of suffering acute hunger.

To summarise, the problem of food insecurity appears to be distinct from that of current poverty. Households are able to reduce their exposure to the risk of hunger if they are able either to accumulate assets, such as livestock or have acess to credit. An alternative or additional strategy is to have a diversified structure of income. The income source which is least vulnerable to rural drought is, of course, urban wage employment and remittances (which are largely from this source) powerfully contribute to the security of the receiving household. Hence, rural-to-urban migration may be seen not only as a strategy to increase expected income but also as a means of ensuring against fluctuations in rural income.

CONCLUSION

Zimbabwe's rural food problem is centrally related to the existence of a substantially differentiated peasantry. Through a careful proportional sampling of rural households, we have set out to provide insights into the food security problem by disaggregating our sub-sectoral image of the "Communal Lands" into different regions and at the level of the household into different income strata and clusters of economic activities. It is from this perspective that we can make sense of the parallel policy initiatives on the one hand (by the Ministry of Lands Agriculture and Rural Ressetlement) to control excesss national cereal production and the related burden on the state, and on the other, the food aid programmes (being administered by the Ministry of Labour, Manpower Planning and Social Welfare) as "drought relief" measures.

Our analysis shows that there is a large fraction of Communal Land producers (approximately 40%) who even in above average seasons do not market any cereals. Even a modest drought might increase this proportion to 60 percent. Conversely, we have shown that a small core of the peasantry (the top 10%) control 40-60 percent of the marketed foods. Even during droughts, this core of surplus producers market significant, but depressed volumes of "food surpluses". Moreover this pattern is broadly replicated across the agro-ecological regions. Thus this small core of surplus producers, who may each market in aggregate 10 times the subsistence requirements of a family, can create the illusion of a self-sufficient district. Conversely when we put on our social welfare spectacles or simple listen to the district welfare officers, we define districts as "short of food" when the Grain Marketing Depot in the same district is full and untouched! Such is the nature of Zimbabwe's rural food problem.

1. This paper is a revised version of a report "Rural Development Policies and Food Security in Zimbabwe: Part II" Rural Employment Policies Branch, Employment and Development Department. International Labour Office, Geneva, 1987.

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