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**Rural Africa Development Project: An Example of
a Farm Level Survey Technique Using Local
Resources**

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NATIONAL COLLEGE
OF AGRICULTURAL
ENGINEERING
SILSOE, BEDFORD
APRIL 1974

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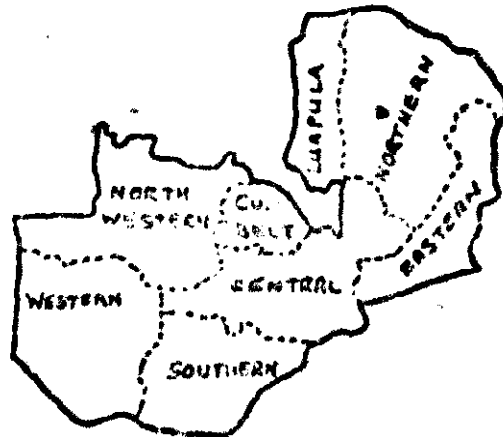
'RURAL AFRICA DEVELOPMENT PROJECT'

N. C. A. E. SILSOE/PROJECT REPORT NO. 3.

APRIL 1974



THE COMPLEXITY OF PROBLEM IDENTIFICATION
AMONGST SMALLHOLDER FARMERS IN AFRICA
AN EXAMPLE OF A FARM-LEVEL SURVEY TECHNIQUE
USING LOCAL RESOURCES



NATIONAL COLLEGE OF AGRICULTURAL ENGINEERING
SILSOE, BEDFORD

FOREWORD

As Chairman of the Agricultural Panel of the Intermediate Technology Development Group, it gives me great pleasure to write this foreword for Mr. Robert Mann's report on the use of farm-level surveys for identifying limiting factors in the work and life of African small-holders. The need for the approach advocated by Mr. Mann has long existed but it is only in recent years that this need has been recognized.

Agricultural research has been carried out (largely by expatriate scientists) at many centres and in many localities throughout tropical Africa over the past 40-50 years. Most of this research has been carefully conceived by European standards and much of it has been competently if not brilliantly executed. Based firmly on the natural sciences it has elucidated many important factors affecting the production of a wide range of valuable crops.

This research in theory has given results of great potential benefit to the African small-holder. In practice few, if any, of these benefits have been realized by the farmer in his work and life. Visitors to agricultural research stations in tropical Africa have long been struck by the striking contrast between the high level of crop production visible on the experimental plots and the subsistence-level systems displayed on small-holdings outside the research farm gate. A thousand years of progress at first sight appears to separate these two extremes.

It was customary in the past to attribute the gulf between research and practice to failures in local agricultural extension work. The scientific data, the advanced technology was there but it was claimed that local extension workers had failed to explain things convincingly to the local farmer. While there is some truth in this claim, it is now realised that it is far from being the whole truth. In too many cases the results of research have been incapable of being applied in practice under the conditions of life and work that obtain on an African small-holding because they are inappropriate for technological, economic or social reasons.

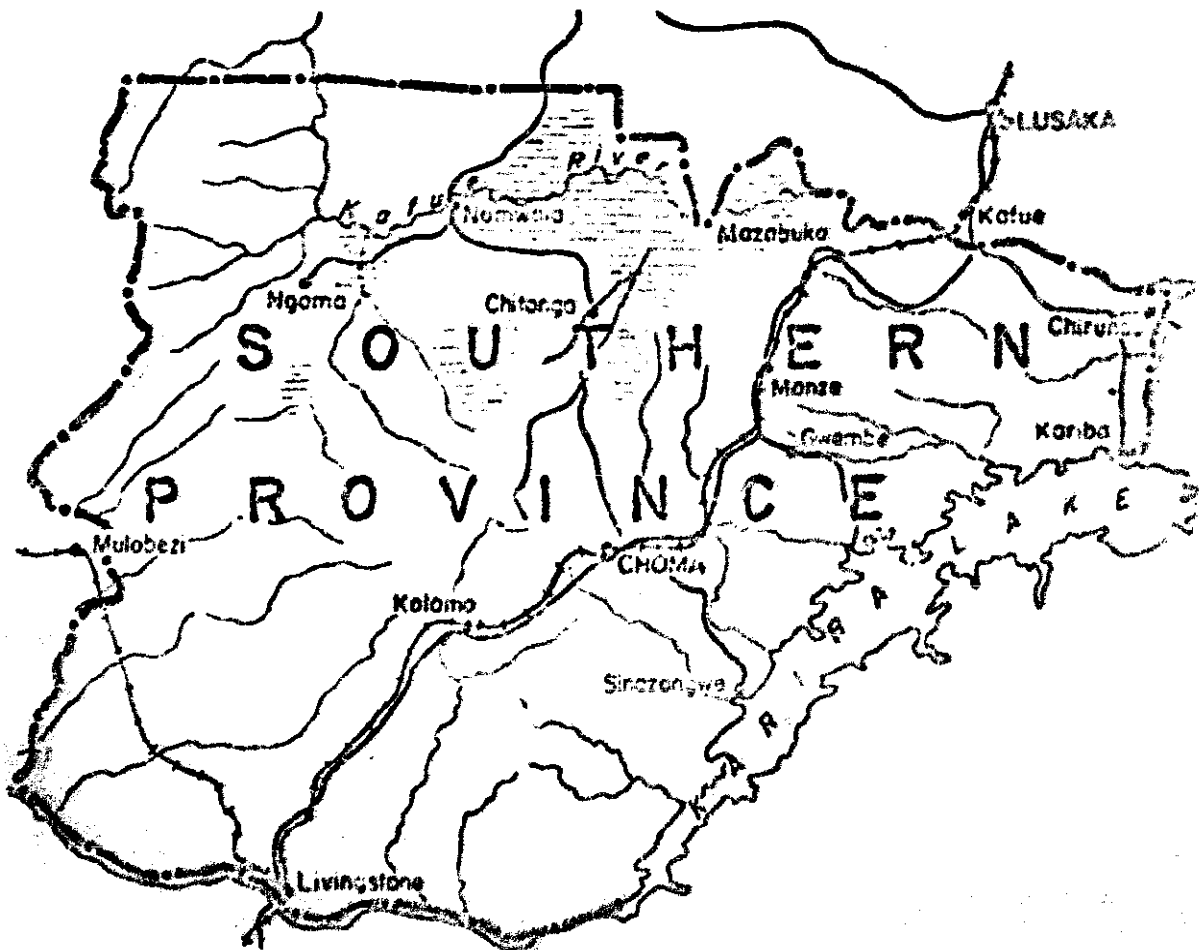
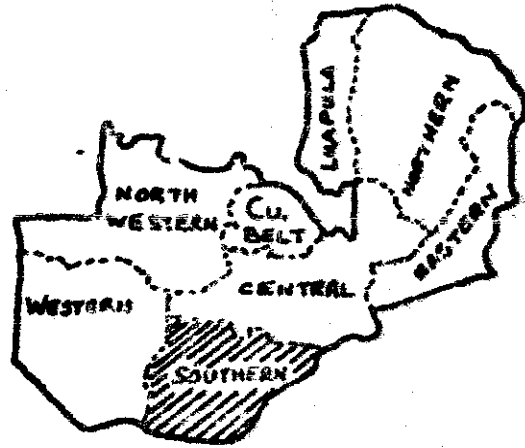
It has to be accepted that in future a pre-requisite for success in agricultural research in tropical Africa is an adequate knowledge of the human systems into which the results of research are to fit. Such knowledge must include an understanding of the technological factors and bottlenecks that operate in the production of various crops and of the ways in which these factors interact with the social, economic and family life of the farmer.

This vitally important knowledge and understanding will not normally be obtained by the broad-brush, macro-level, socio-economic surveys commonly carried out in recent years. There is no escaping the need for careful micro-level examination of local practices on individual small holdings. It is here that the value of Mr. Mann's report is apparent, for he describes in detail how such examinations may be carried out by farm-level survey techniques within the grasp of the non-specialist worker. His report makes available the results of much field experience at the small-holder level and represents an important contribution to work on rural development in Africa.

HSD:ejc
5th August, 1974

H. S. DARLING

GEOGRAPHICAL LOCATION OF THE SURVEY AREA :
ZAMBIA, CENTRAL AFRICA



"the one and only sound foundation to agricultural and related development is an ecological one, constituted by knowledge of the climate, vegetational and soil features of a specific locality".

J. Phillips. 'Agriculture and Ecology in Africa', 1959.

"In order to be developed, tropical agriculture must be studied now in a decidedly economic and quantitative framework. The time of 'guesstimates' is gone. It is now time to be rigorous, to measure and to use figures."

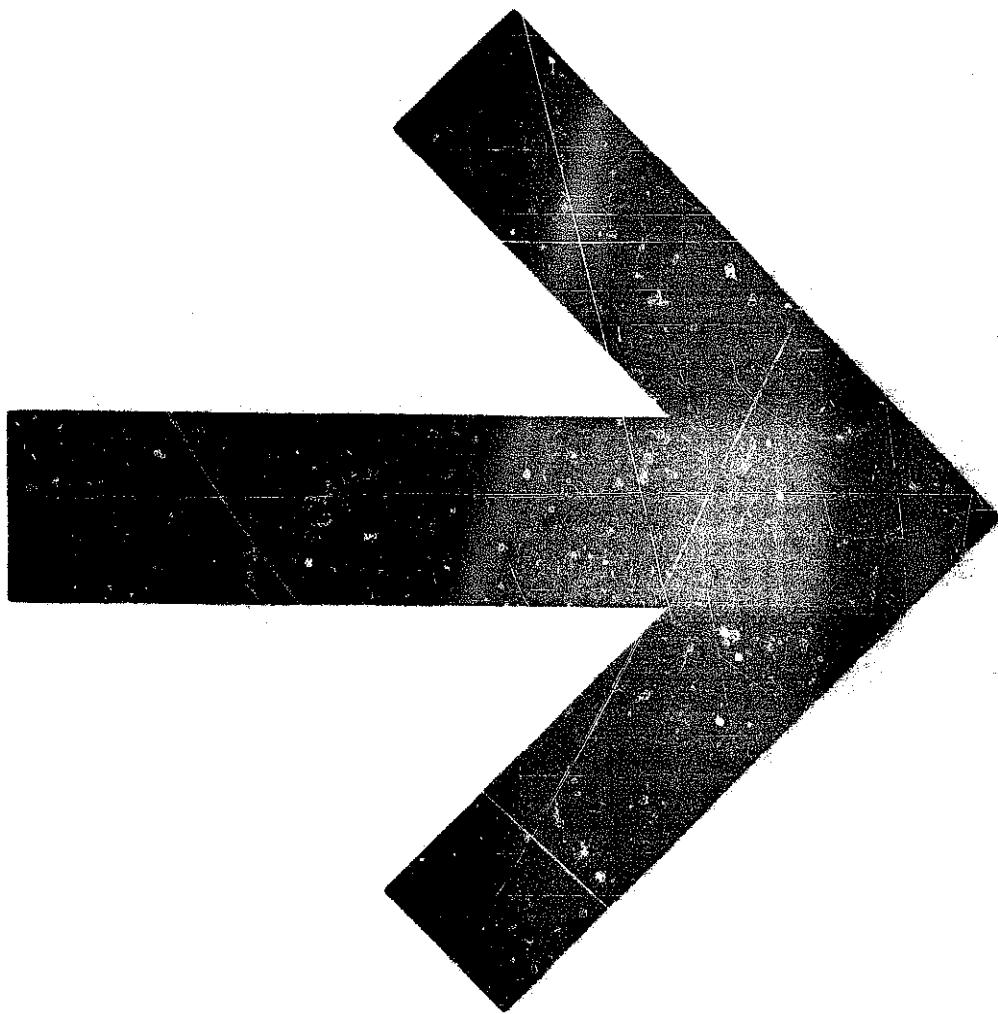
R. Chabrolin. 'Study of Labour Input in Tropical Agriculture'. Conference on Agricultural Research Priorities for Economic Development in Africa, Abidjan, Ivory Coast, 1965.

"Until better theory can be developed and more solid micro-level data collected, economists are limited in advising policy makers on problems of employment in rural areas."

D. Byerlee and C.K. Richer. African Rural Employment Study, Paper No.1. 'Rural Employment, Migration and Economic Development'. Michigan State University, 1972.

"The macro planners (in Africa) are now part of the established infrastructure of these economies. Their experience during the 1960's has created an awareness that development plans are missing a link with the dominant type of production unit in agriculture, the smallholder."

M.P. Collinson. 'Transferring Technology to Developing Economies: The example of applying Farm Management Economics in Traditional African Agriculture'. European Regional Conference, Oxford, 1973.



**THE COMPLEXITY OF PROBLEM IDENTIFICATION
AMONGST SMALLHOLDER FARMERS IN AFRICA**

**AN EXAMPLE OF A FARM-LEVEL SURVEY
TECHNIQUE USING LOCAL RESOURCES**

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PART I

PROBLEM IDENTIFICATION AMONGST SMALLHOLDER FARMERS IN AFRICA

INTRODUCTION

The introduction of an acceptable combination of innovations/
improved management techniques in the appropriate order of priority
consistent with the actual needs of a given rural community is the ultimate
aim of all who are engaged in the task of trying to bring about real progress
in African 'farming systems'.

Basic 'farming systems' have been evolved over generations by the
very ingenuity of the African husbandman, and his understanding of production
measures to help ensure the provision of essential needs is most comprehensive.

THE NEED FOR COMPREHENSIVE INFORMATION

Many new tools, pieces of equipment, or forms of improved crop
husbandry, have been designed and tried in farming systems just because it
was 'generally thought' or assumed that a particular task was limiting or
onerous, or that the current crop-husbandry methods used were giving below-
desirable yields, only to find that such new ideas were not adopted.

Receptivity to change at farmer level is governed by socio-economic
as well as technical factors, and the greater the depth of understanding of
the constraints within a farming system the better will be the chance to
identify the real problems and to introduce acceptable improvements.

If rural development is to be effectively started and its progress
maintained, the preliminary investigation of present problems in any one area/
community must take into account the many inter-related factors, the
combination of which is determining the current stage of development.

In short, it is essential that an investigation in detail be
carried out to ascertain the total picture of the farming calendar and
cropping sequence, taking into account the traditional communal customs/
obligations, essential economic pattern, and ecological conditions on
which the present farming system is based.

The 'type-of-farming' in Africa varies between such extremes as to
make it not practical to devise a single questionnaire format or analytical
method suitable for all circumstances.

However, as this paper is aimed at assisting African farming

communities in the many different bioclimatic regions throughout the continent, a guide to the information content necessary to cover all major assets/activities ranging from semi-nomadic/subsistence level to intensive/monetised production, is provided as follows.

QUESTIONNAIRE - GENERAL SECTION

(A) Labour Available

(1) Family:

Age - groups

No. of family members	Under 10 yrs	10 - 14 yrs	15 - 19 yrs	20 - 50 yrs	over 50 yrs
Male					
Female					

(2) When hired labour used or available:

Class of hired labour	For what work	No. of people	Approx. age of each person	Male	Female	Cost per day/wk/month, in cash in kind
Regular						
Seasonal						
Casual						

No. of days of hired labour used per month

Class	Age of each person	J	F	M	A	M	J	J	A	S	O	N	D	Total
Regular														
Seasonal														
Casual														
Total per month														

(3) Normal number of hours worked per day per person in the field throughout the year.

	J	F	M	A	M	J	J	A	S	O	N	D
Hours work per day												
* Variation reason												

* Insert either: A = arduous work, L = light work, S = slack period, C = climatically arduous conditions: e. g. very hot/humid, FS = food shortage period, I = seasonal period when illness common, P = peak demand labour period.

(B) Labour Use

- (1) Which family members carry out domestic household work, e.g. water-collecting, fuel/food collecting, cooking, going to market etc.

Family Member	Approx. age of each person	Task	Insert full-time, or hours per day.

- (2) Where members of the family are engaged full-time or part-time on livestock enterprises, specify below:

Family Member	Age	Insert FT = full-time, or no. of days per month											
		J	F	M	A	M	J	J	A	S	O	N	D

- (3) Is the whole family engaged full-time on production work on the family farm and/or communal farms/activities,
-

- (4) Where 'off-farm' employment is carried out:

State family member, age, kind of work, rate of pay in cash and/or kind	No. of days 'off-farm' employed ^a per month											
	J	F	M	A	M	J	J	A	S	O	N	D

- (5) Does the family run any business; e.g. trading, contracting, which is separate from farm activities, if so specify who carries out the business, its type, and over which period(s) of the year,
-
-

(C) Homestead

(1) Is the homestead permanent. -----

(2) Describe construction of homestead buildings,

(3) If homestead moved periodically;

(a) How often, and to what distance from previous position during the past 15 years,

(b) Was homestead moved to virgin land, or moved within long-term shifting cropping/fallow pattern,

(D) Household

(1) Household water requirement obtained from _____, at what distance, _____, quantity used per day, _____, specify any seasonal shortage.

(2) Who decides what crops to grow, and their position on the farm,

(3) Who decides policy on livestock enterprises, -----

(4) Who is responsible for production of food crops, -----

(5) Who decides on cash crop production, -----

(6) Where individual family members are allocated certain production activities, give details below:

Household member	Responsible for which crop/livestock prod.	Rights of member to proceeds, % of total	% of proceeds contributed to household

- (3) Is the household required to contribute food or labour to other members of the community who have had poor crop yields through sickness or some other misfortune (specify if relevant),
-
-

- (4) Specify any communal facilities available to the household; e.g. storage, transport, communally owned tools/machines, crop processing,
-
-
-

(G) Area of Farm, Field Size, Soil Type and Topography

N. B. Use unit of measure as appropriate; e.g. hectares, acres.

- (1) Total farm area (crops and fallow), -----
- (2) Grazing area, if owned or rented (not communal) and additional to area given in (1) above, -----
- (3) Total area cropped per year, -----
- (4) Indicate number, approx. size, and whereabouts of separate fields or plots on the farm, also noting soil type and topography, as follows:

Approx. size of fields/plots	No. of fields/plots and distance of each from homestead	Soil Type	Topography *
Under $\frac{1}{2}$ acre, or 0.2 ha, or equiv.	-----	-----	-----
$\frac{1}{2}$ acre - 3 acres, or 0.2 ha - 1 ha, or equiv.	-----	-----	-----
Over 3 acres, or 1 ha, or equiv.	-----	-----	-----

* Insert one or more of the following for each field/plot as appropriate.

VB = Valley bottom, L = level land, S = gently sloping (give % slope).
 H = hillside (give % slope), HT = hill top, WH = year-round high water table,
 IL = irrigated land, SF = land subject to seasonal flooding.

(H) Soil Fertility Trend/Land Availability

- (1) Is fallow land being put back to crops before satisfactory fertility level regained, due to land shortage/population pressure,
-
-

(2) Is natural grazing land deteriorating due to overstocking, and if so are any measures being taken by household, community, or local authorities to rectify the situation,

(3) Is additional land for extension of acreage per family readily available, and if so specify general soil type, vegetation cover and distance of such available extra land from homestead,

(4) Do village headmen, community elders or the older farmers re-collect any significant progressive changes in soil productivity, vegetation type, areas for grazing, seasonal stream or river flow/flooding; if so, specify.

(I) Soil Conservation/Erosion

(1) Specify any general soil conservation practices used; e. g. strip cropping, bunds, terraces, ridging, soil tillage practices such as use of pointed or tined (non soil-inverting) tools for land preparation, surface trash/crop residue left on surface, etc.

(2) If soil erosion is evident, specify to what degree (sheet, gully), occurring on what soil type and % land slope.

(J) Rainfall Pattern/Reliability

(1) Insert average rainfall pattern below

	J	F	M	A	M	J	J	A	S	O	N	D	Total for year
Inches or millimetres													

(2) Is replanting common, moderately common, or very occasional, due to lack of rain or late rains, and if so give details,

(3) Has there been a total crop failure due to lack of rain during the past 7 years,

(K) Cropping Pattern

(1) When new land is cleared for the first time, describe the sequence and time of clearing operation:

Vegetation Type	Clearing method, tools and sequence	During month(s)	Man/days per unit area cleared
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----

(2) Are any crops grown every year adjacent to homestead compound, specify (include details of inter-cropping).

(3) General cropping patterns;

Soil Type	Insert 1st crop(s), followed by crop(s)/fallow in sequence, putting in () the number of years of each crop(s) or fallow to show the total length of land use cycle. *
-----	----- -----
-----	----- -----
-----	----- -----
-----	----- -----

* (a) Where inter-cropping occurs, denote by inserting 'IC' against the crops concerned in the particular point of the land use sequence.

(b) Specify if fallow is a 'crop' fallow as distinct from natural regeneration grass/bush fallow.

(4) Have any new cash crops been introduced during the past 10 years, specify crop and when introduced.

(5) During 'peak-demand' labour periods, which crop(s) are considered the most important and receive priority for allocation of available labour; specify crop and the particular operation which receives priority attention.

(6) Are there any special weeds which are difficult to eradicate; specify weed, soil and topography of that weed problem area,

Food Pattern

(1) What are the staple food crops grown and quantity consumed.

Category	Crops	Estimated quantity consumed by household in each year.
Grain	-----	-----
Root starch	-----	-----
Legume	-----	-----
Fruits	-----	-----
Vegetables	-----	-----
Others, specify	-----	-----

(2) Have any new food crops been introduced during the past 10 years; specify crop(s), when introduced, and for what reason.

(3) Which of the staple food crops, or mixtures of them, are distinctly preferred; list in order of preference,

(4) Usual availability and periods of consumption of staple foods.

Food or food mixtures	Period of availability and consumption											
	J	F	M	A	M	J	J	A	S	O	N	D

(5) Is there any period of general food shortage; specify periods,

(6) What crops are grown and classified as famine-relief reserve food crops,

(7) in a bad year of food crop shortfall/failure, what measures are taken by the family to economise on consumption or obtain food from elsewhere,

(M) Marketing of Crops

(1) Describe the form of marketing system available for the farmers,

(a) Cash Crops,

(b) Surplus Food Crops,

(2) At what distances are the markets from the homestead;

(a) For cash crops, -----

(b) For surplus food crops, -----

(N) Following information required to be listed/detailed on separate sheets and attached to this questionnaire.

(1) List of equipment used in crop/livestock production

Draw up a list of all items of equipment, hand tools, machines, power sources (engines, draught animals) and buildings which are used in crop/livestock production by the farmer, specifying cost in cash, or man/days labour plus materials (where built by farmer), estimated life and replacement part/upkeep cost details of each item.

Mention where any such asset items are used solely for the production/processing of a particular crop/enterprise.

(2) Produce values

Draw up a list of the current market prices and sale values to the farmer of his cash crops, livestock products, and food crops, per unit quantity, giving a market value for each of the food crops and livestock products irrespective of whether they are sold or not.

(3) Purchases/Expenditure

- (a) List the items purchased for household use; e.g. household tools/equipment, fuel and additional foods, giving a total cost for each item for the past year.
- (b) List the items purchased as recurrent crop production inputs; e.g. fertilisers, seed, spray chemicals, livestock food and medicines, fuels and oils for engines, hire of transport for crops, and give a total cost for each item for the past year.
- (c) List other items of out-of-pocket family expenditure during the past year; e.g. taxes, clothing, school fees, etc.

(4) Current Change/Innovations

Describe any current change or innovations being introduced into the farming system such as:

- (a) permanent crops/new cash crops.
- (b) improved crop husbandry.
- (c) livestock enterprises, breeding, disease prevention, feeding/grazing management.
- (d) processing of crops/livestock products.
- (e) marketing structure/incentives.
- (f) improved storage of crops.
- (g) new tools/equipment/power sources.

N.B. Note if any innovations have been tried in the past 10 years which did not gain acceptance, giving likely reason.

(5) Local Research Information

- (a) Collect and list local research data on recommendations for crop/livestock husbandry practices for the area under survey.
- (b) Search all possible sources for 'ecological-change' indicator information; i.e. aerial photographs, print lay-downs/notes, past and present soil/vegetation maps and farm-level agronomy/livestock surveys.

(6) Training facilities, local craftsmen and raw materials.

Describe any local facilities which may exist for training of farmers in improved crop husbandry, e.g. farmer training centres, courses held at Research Stations, and also provide information on the availability of rural craftsmen in the survey area, e.g. carpenters and blacksmiths, their facilities in the way of tools, and the type of timber and metal raw materials available.

(o)

QUESTIONNAIRE - CROPS

N.B. Complete a separate sheet for each crop plot/field.

Crop _____ **Area of Field** _____ **Av. Yield** _____ **Soil Type** _____

Following: **Fallow** _____ (Type Specify) of _____ year(s) duration
 or, **Crop** _____ (Type Specify) grows in same field for _____ year(s)
 if **inter-cropped**, specify _____

Grown as: **Food Crop** _____ consumed over what period _____
 if **Cash Crop**, sold where _____ when _____ a. price of _____ per unit.

Operation	During week(s) of month(s), (Specify)	Description of tools/equipment, method used.	Carried out by men, women, communal work, hired labour.*	Time taken to complete operation	
				No. of people	No. of days
Preparing land: up to final seed bed, specify whether flat, ridge, furrow, mound, pit, etc., soil inverted or not inverted, trash/crop residue left on surface.					
Nursery beds: specify preparation of seedlings.					
Sowing/Planting: specify whether transplanting, cuttings, broadcast, row planting, spacing, and quantity used.					
Mulching: type, quantity					
Tree Pruning: describe					
Manuring: type, quantity					
Weeding: separate operations into 1st, 2nd, 3rd weeding etc. specify where combined with thinning, earthing up, topping					
Spraying: specify number, rate/quantity, fungicide, insecticide, herbicide, etc.					
Crop Protection: e.g. vermin, birds					
Harvesting: picking, lifting, cutting, reaping, heaping/stacking, crop uprooting/residue disposal					
Transport: specify purpose, distance					
Crop Processing: shelling, threshing, winnowing, drying, sorting/grading. For food, grinding, milling, etc.					
Storage: method, where for what period					

Note: (1) Specify yield in terms of weight and volume according to certain conditions of climate, vegetation, etc.
 (2) State if the crop is irrigated at certain times, or if flood or furrow irrigation is used.
 (3) Specify if planting and harvesting is staggered over a long period.
 * (4) Insert the approximate number of each person who is a family member or hired labour.

(P)

QUESTIONNAIRE - LIVESTOCK ENTERPRISES

	Cattle	Goats, sheep	Donkeys, Horses, Others Specify	Poultry
	Bullocks, cows, milk cows, young stock, calves			
<u>Number:</u> indicate age groups of live stock. *				
<u>Grazing:</u> type, extensive, rotational/seasonal, area, where, communal (describe)				
<u>Housing:</u> type of construction, where				
<u>If housed:</u> describe housing, use of litter/bedding, collection of fodder, feeding (type and quantity)				
<u>Water Availability:</u> source, abundant, seasonal availability, where located, how often livestock watered				
<u>Labour:</u> herdsmen/livestock tending, by men, women, children, specify number of people hours of grazing/tending per day				
<u>Manure:</u> collected, made, used where/when, how transported, by whom				
<u>Breeding:</u> controlled, random, describe				
<u>Mortality Rate:</u>				
<u>Main Diseases:</u>				
<u>Disease Prevention:</u> Specify measures.				
<u>Livestock Use:</u> for security, barter/exchange				
<u>Livestock Produce:</u> Per year: Sales, total income received for sale of stock, meat, hides, milk, milk products, poultry products, etc.				
<u>Produce Processing:</u> Describe any farm processing of livestock products				

* Indicate, under 1 year, 1-2 years, over 2 years.

(g)

Method of Summarising Farm Pattern and Indicating Use of Available Labour

Climatic Pattern

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total

Average Rainfall in/mm.
Mean Temperature °F/°C.

Calendar of Operations - Crops

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.

Food Crops
Cash Crops

Showing periods of major operations, and indicating operation priorities during 'peak - demand' labour periods.

Food Availability Pattern

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.

Indicating overall pattern of relative adequacy and shortage.

Crops - Total man/days labour input per crop per month.

Crops	Area	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total
Food Crops														
Cash Crops														
Total per month														

Histogram 1.

Man/days labour input for crop production per month, including hired labour.

- (1) Show inputs for food crops (total)
- (2) Show inputs for cash crops (total)
- (3) Show total combined input for cash and food crops.

Man/days
input

Household Work - Total man/days labour input per month.

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total

Total per month

(Q) continued.

Livestock Enterprises - Total man/days labour input per month

Total per month

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total

* Communal Activities - Total man/days labour inputs per month

Total per month

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total

*Do not include 'on-farm' communal tasks which have been specified and included in the labour inputs for crops.

Off-Farm Employment - Total man/days labour inputs per month

Total per month

JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	Total

Histogram 2.

Distribution of total available labour per month

Where appropriate, indicate separately :

- (1) Family labour (crops)
- (2) Hired labour (crops)
- (3) Inputs for household work.
- (4) Inputs for livestock (where significant).
- (5) Inputs for communal activities (where significant).
- (6) Inputs for off-farm employment.

Man/days
Input

Notes on Questionnaire - General Section

This section is divided into 14 parts, as shown in (A) to (N) above.

(A) Labour Available

Information on family and hired labour available can be converted into Man Equivalents (ME) as follows: Note: example only, will vary with area.

Age-group	10 - 14	15 - 19	20 - 50	over 50
Male (ME)	0.25	0.67	1.00	0.67
Female (ME)	0.25	0.50	0.67	0.50

(B) Labour Use

This part provides information on how much of available labour is used in household work, livestock enterprises and 'off-farm' employment.

(C) Homestead

Answers to questions in this part will indicate the level of farming and homestead/farm stability or shifting pattern.

(D) Household

In this part information is being sought on division of responsibilities within the farmers' family, and the nature of the individuals' rights to certain production proceeds, these factors having a bearing on acceptability of innovations.

(E) Land Tenure

The land tenure questions are aimed at clarification of the farmer's position concerning his degree of assurity on continuing ownership or use of his total area of farm land, since this is one of the main factors which determine the extent of opportunity for long-term improvement and the amount of additional investment which farmers are willing to undertake.

(F) Communal Activities/Obligations

The information gained in this section will show the extent to which the activities of the family are governed by communal requirements, the degree of assistance afforded one to the other amongst the community, the periods and time consumed in communal work, and will also assist with assessment of the opportunity to introduce communally-operated equipment or new husbandry methods where the overall picture of the survey indicates the economic viability and advantage of introducing innovations on a co-operative-use basis.

(G) Area of Farm, Field Size, Soil Type and Topography

Most farmers do not know the actual area of the fields, and actual physical measurement is necessary.

The information assembled in this part will give a good general picture of the farm, showing degree of fragmentation, soil type range, and the topography of the farm land.

(H) Soil Fertility Trend/Land Availability

This part is designed to identify whether or not there is a continual falling off in soil fertility, and the availability of additional new farm land in the area (other than land resting in a natural long-term fallow of a cropping/fallow cycle).

(I) Soil Conservation/Erosion

In this part, existing soil conservation measures and the severity of erosion are specified, information which is essential when considering the design of soil-tillage tools or crop agronomy improvements.

(J) Rainfall Pattern./Reliability

This part endeavours to determine the general rainfall pattern and its reliability, since in many 'type of farming' areas these factors have been responsible for the traditional land tillage and planting methods used.

(K) Cropping Pattern

Information obtained in this part will include man/days input for clearing of new land, the determination of whether there is a crop rotation proper or varying degrees of cropping with intermittent fallow or long-term crop/fallowing cycle, with detail of such cropping patterns related to soil types, and the incidence of inter-cropping.

This part will also specify which crops receive priority for available labour at 'peak-demand' periods, and any special weed problems.

The information gained in this section, in conjunction with that from parts G,H,I and J above, will assist in determining soil-type production capabilities, show up certain inherent cropping patterns which may need special attention when introducing new agronomy techniques, and also provide basic indicators on soil fertility, bioclimatic conditions and ecological changes.

(L) Food Pattern

In this part a detailed examination is made of the staple food crops grown, the quantity required by the family, the periods of consumption, availability and shortage of food crops.

(M) Marketing of Crops

This part of the questionnaire is concerned with the type and availability of markets for the farmers cash crops and surplus food crops.

(N) Additional Information

In the last part of the 'Questionnaire - General Section', further information is collected and presented under the following headings:

- (1) Assets associated with farm production.
- (2) Produce values.
- (3) Purchases/Expenditure.
- (4) Current Change/Innovations.
- (5) Collection of local research data.
- (6) Description of training facilities, local craftsmen and raw materials.

Notes on Questionnaire - Crops

The Questionnaire - Crops, shown in (O) above, requires a separate sheet to be filled in for each crop or crop mixture grown on the farm.

Information given in the head section of each sheet will indicate the area and yield from that area, and will locate the position in the cropping cycle according to field and soil type.

The information given in the tabulated section of each sheet will indicate the period, tools/equipment, method used, category of labour and the labour input for each operation throughout the length of the production period, and from this latter data the 'Calendar of Operations' for each crop and 'Total man/days labour input per crop per month' can be drawn up.

The information on tools/equipment and method used for each operation in the Questionnaire - Crops will provide important guide lines when considering the design of new tools and equipment to be introduced.

Notes on Questionnaire - Livestock Enterprises.

Number and ages of livestock can be converted into Livestock Units (LU) as follows: Note; An example only, will vary with area.

Cows and bulls over 2 years	1.00	LU
Cows and bulls 1 - 2 years	0.70	LU
Calves and heifers under 1 year	0.30	LU
Donkeys	1.00	LU
Goats and sheep over 1 year	0.15	LU
Goats and sheep under 1 year	0.05	LU

The information given in the Questionnaire - Livestock Enterprises, shown in (P) above, will indicate the extensive or intensive nature of such enterprises, the annual production, and allow assessment of the opportunities for introducing better grazing methods and improved livestock husbandry.

Note should be made where; (a) there is a reciprocal grazing-right arrangement between neighbouring farmers, (b) farmers owning draught animals/herds hand them over to pastoralists during a part of the year, or (c) pastoralists graze their livestock on other farmers arable or fallow land.

Notes on Summarising Farm Pattern.

(1) The method of presenting a summary of the farm pattern data, which will enable the overall picture of the inputs and constraints to be seen quickly, is the horizontal 'calendar method', an example being provided in (Q) above.

This entails the positioning of tables of variants/patterns, operations and input data so that all factors occurring in each period appear in line vertically, and this facilitates the compiling of histograms and the assessment of critical periods in the cropping season.

(2) Part (P) Communal Activities/Obligations, item (2), of the Questionnaire - General Section may include cases where neighbouring farmers congregate and carry out a particular 'on-farm' task (such as weeding, harvesting) as a group on each of their respective farms in turn. Care must be taken not to include these in the histograms of a particular district, or of a particular farm, since these same inputs will appear in the Crops section.

(3) The manner of separating certain categories of labour use input data in the histograms indicated in part (4) is purely suggestive and gives an example of what divisions may be required.

The actual categories for separate indication in the histograms will be chosen by the person who evaluates the basic survey data to show the major competing and complementary inputs, and the combination of all essential types of input at the "peak-demand" labour periods, in order to indicate most clearly the real problem areas which need attention.

General Remarks

(1) The order in which questions are asked and/or information obtained is not necessarily as given in the list above, but will be determined by the survey personnel as that which is best suited to the particular local conditions and time of year as the survey proceeds.

Certain sections are omitted where, in a given area:

- a) it is not applicable to the 'farming system'
- b) the information is already available

(2) The field staff conducting such a survey must have sufficient field experience to enable them to:

- a) fully understand the reasons for asking each and every question involved
- b) gain the confidence of the farming communities concerned
- c) correlate all aspects and implications of the incoming data/information

(3) The overall farm pattern and its problems is read from the histogram indications in conjunction with the 'food availability' and 'climatic' patterns, and the sociological/communal and ecological factors which may have arisen during the enumeration of the general survey.

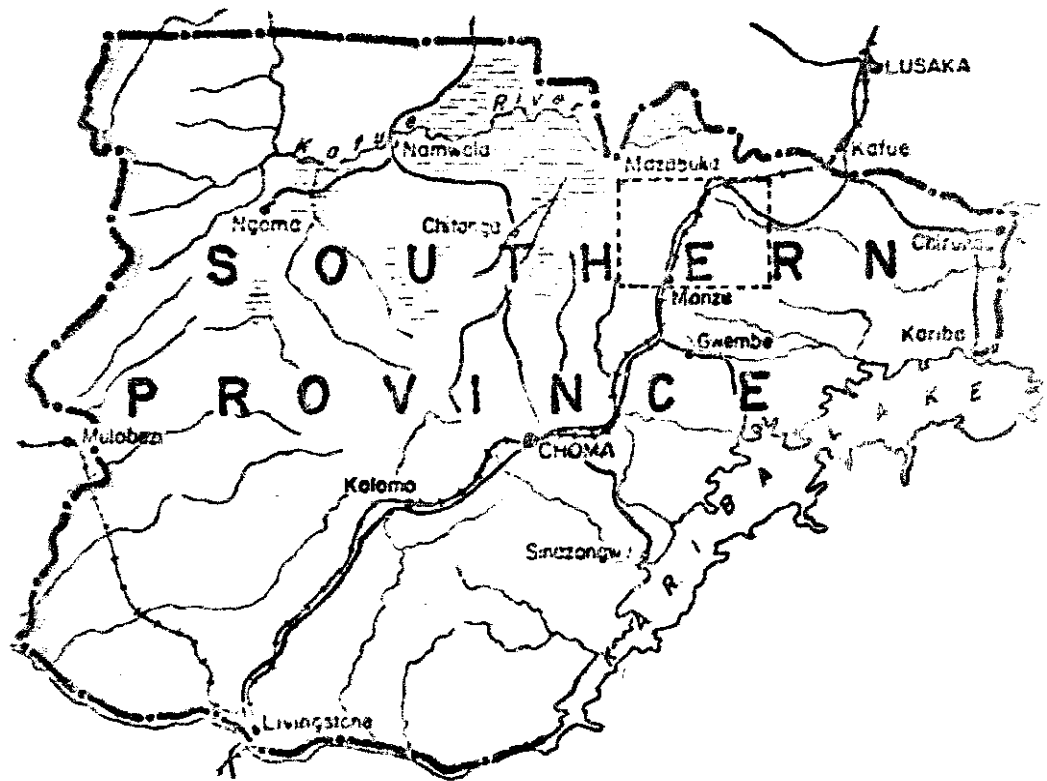
(4) In the farm pattern summary, section (q) and in parts of the general section from (A) to (I), reference is made or indication given to calendar months for ease of illustration, but in practice this unit of time division is unsuitable and not used. The inputs throughout a farm-level survey are recorded per day, week, 2-week or 4-week period as deemed appropriate consistent with the combined requirements of expediency, data accuracy and adequate information to permit viable analysis.

(5) This guide to the information content required has been provided in the form of a questionnaire for ease of explanation and it must be emphasized that it is not intended for direct use in the field as such. All farm-level surveys, in this category are preceded by a preliminary investigation stage, and it is during this initial period and resulting from its findings that the question-sheet format and overall survey procedure is worked out according to the requirements of the particular area concerned.

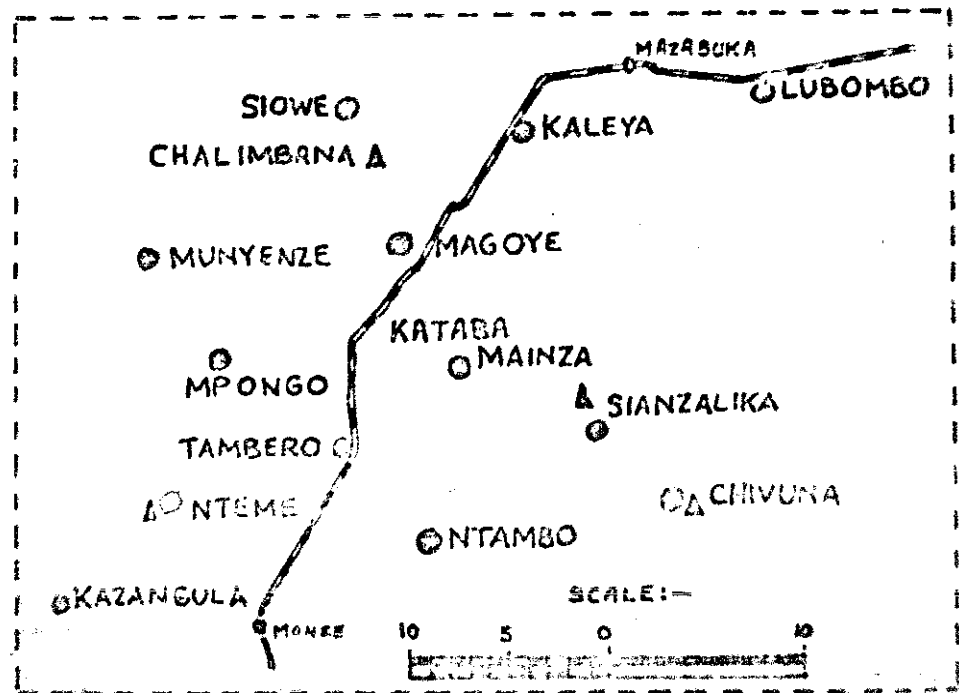
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PART II



DETAIL OF THE DEMARCATED AREA SHOWN IN THE MAP ABOVE



PART IIAN EXAMPLE OF A FARM-LEVEL LABOUR UTILISATION INVESTIGATION USING LOCAL RESOURCESINTRODUCTION

The following information is an extract from data obtained during the course of a joint GRZ/ITEG work programme based at the Regional Research Station, Magoye, in the Southern Province of Zambia.

PROJECT OBJECTIVES

The basic objectives of the project are -

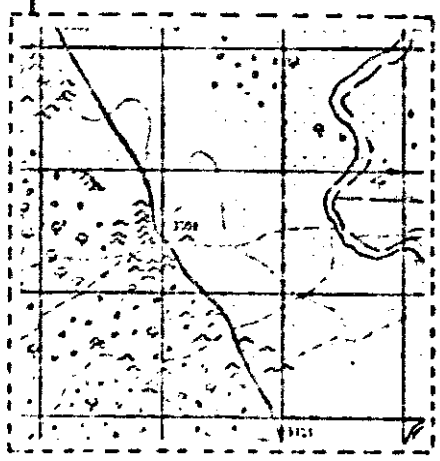
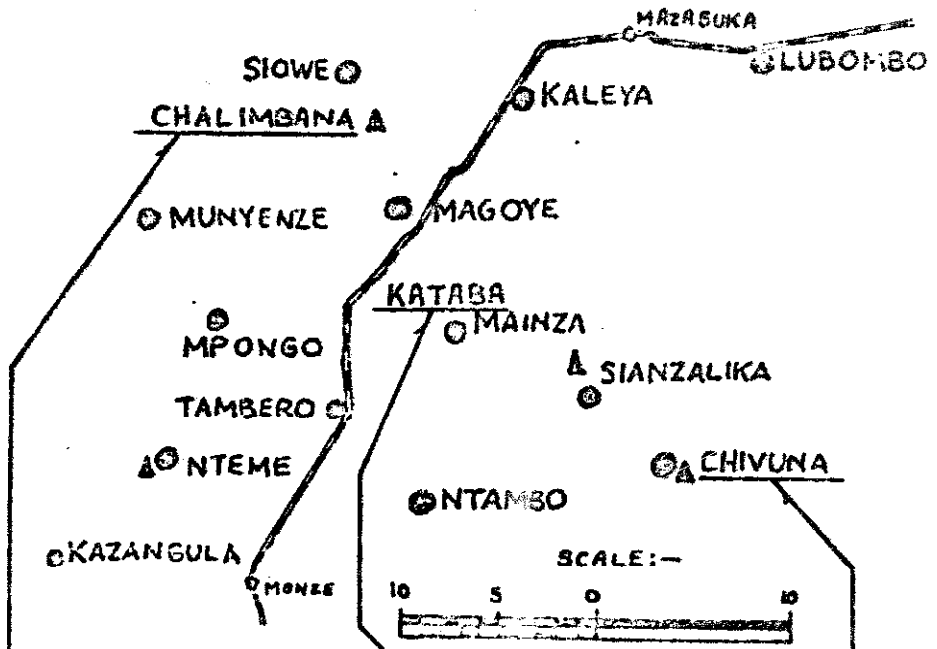
- a) to identify needs for improved farm tools and equipment and
- b) to develop and test suitable types of machinery and to assist in the setting up of facilities for local manufacture of such in rural areas.

Mazabuka District was selected as the area in which the project would concentrate its activities. In this area, farm-based surveys to determine labour utilisation had not previously been carried out in detail. Therefore, as part of the initial ITEG work programme to identify needs for improved farm tools and equipment, it was considered necessary that a farm-level investigation be carried out to ascertain the major factors which are currently limiting crop production amongst the majority of small farmers.

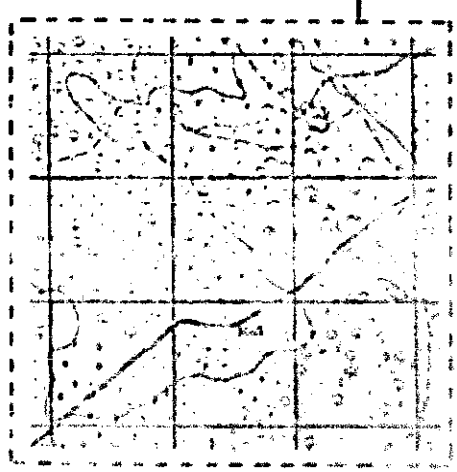
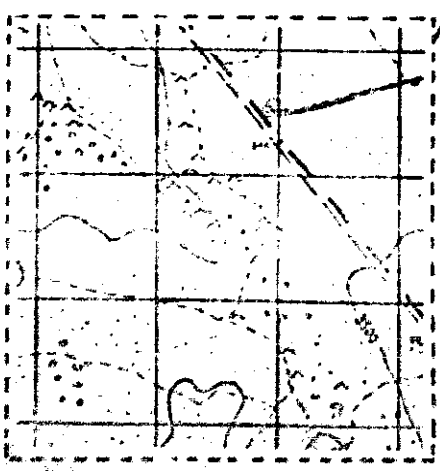
PRELIMINARY FIELD WORK

During a 4-week period in September 1971 the following was carried out:

- a) The Plateau Tonga Maize area in Mazabuka District was identified as a uniform 'type-of-farming' area
- b) Three sites were selected, one each at Chalimbana, Kataba and Chivuna, on the criteria that:
 - (i) they contained farmers representative of a cross-section cultivating from 5 to 20 acres approximately
 - (ii) all of these areas could be visited daily throughout the 'season'.
- c) A preliminary investigation of the main crops calendar/field operations currently practised was made



SCALE:—
1:50,000



- d) Field Recorders for each area were engaged, the schooling of these field staff being equivalent to a level 3 years below Ordinary Cambridge Certificate.

During October 1971 the following was achieved:

- e) Meetings were held with the local Chiefs, farmers and agricultural staff in each area to explain the purpose of the forthcoming survey.
- f) From previous field observation, the smallholders common asset structure was noted and a preliminary investigation sheet compiled, as shown in Table 2. Using this questionnaire form, approximately 50 farmers in each of the survey sites were interviewed.
- g) From the information obtained in (f) above, the daily recording (Table 3) and weekly summary (Table 4) sheets were designed.
- h) For the actual survey sample, farmers were selected according to the criteria of:
- (i) their providing a fair cross-section by way of area cultivated/ equipment used
 - (ii) their known willingness, from previous experience of local field personnel, to provide detailed information about their farming activities.

THE SURVEY PROCEDURE

Right from the project initiation stage it was intended to keep the amount of data to be collected at farmer level to the absolute minimum.

In the Southern Province of Zambia, surveys had previously been carried out in detail concerning vegetation, soils, land holding, family social structure, and crop production at market level. For the purposes of the survey it was, therefore, decided to concentrate on available labour utilisation and the measurement of each farmer's cultivated land.

Furthermore, it was decided to use the horizontal calendar method for presenting a summary of the farm pattern data, as this enables the overall picture of inputs and constraints to be most readily seen.

The farm-level survey recording method used is indicated in Table 1.

The field personnel engaged on the survey work consisted of a Project

Leader with considerable experience of agricultural extension at farmer level. 5 Field Recorders, and a Clerical Recorder whose main task was to transfer field recorded data through to the pre-summary stage.

From the preliminary investigation (Table 2) a total of 30 farmers were selected, 6 farmers being allocated to each of the 5 Field Recorders for daily recording of activities using the question sheet given in Table 3.

Each farmer was given a code letter. The daily collection of farmers' activity data started on 1st November 1971. When land preparation commenced, a peg with code letter and number was placed in each of the farmer's fields to ease future checking of activities per field per farm.

As time permitted during the season, the area of each farmer's field was measured by pacing the field boundaries and taking bearings at the corners with a prismatic compass. Over a period the Field Recorders were trained in this particular skill to the stage where they were able to carry out this method of field measurement by themselves. The actual field sizes were later calculated by plotting boundaries to scale on squared paper.

During the first few months of the survey the Field Recorders required constant supervision to ensure that they were carrying out their duties properly. However, after this essential training period, the amount of direct checking at field and farmer level was progressively reduced as the Recorders gained confidence and competence in their work.

The Field Recorders were visited several times each week by the Project Leader to allow any problems to be dealt with quickly. At the start of the project it had been agreed with the local Agricultural Officer that the daily duties of any Recorder who became ill or had to be absent would be taken over by a member of the agricultural extension staff to ensure continuity.

The Daily Record sheets (Table 3) were collected weekly, and from these the Weekly Summary per farm (Table 4) compiled by the Project Leader.

THE SUMMARISING AND DATA REPRESENTATION WHICH

In June 1972, at which time it was possible to assess the main agricultural production characteristics of the 'farming system' under review, the Year's Summary Farm Pattern sheets were designed, these being shown in Tables 7, 8 and 10. In order to facilitate cross-checking of figures and calculations, the basic data from the Weekly Summary (Table 4) was transferred through on the forms given in Tables 5, 6 and 9. In the subsequent 1972

After the Year's Summary has been compiled, a sheet giving general information relating to each farmer is drawn up, an example of such for this survey being given in Table 11. With reference to this latter general information sheet, it will be noted that each member of the farmer's family is given a rating according to age, which provides the total available man-equivalent per family.

All figures arrived at in the labour inputs for the various activities were calculated on the man-equivalent basis.

The household/domestic category includes all labour input involved in collecting food, firewood, preparing meals, looking after children and building essential structures at the homestead.

It was intended that the data collected be presented in an easy-to-read manner, and a key system to match this requirement was drawn up as shown in Table 12.

Of the 30 farms initially under survey, only one had to be omitted (due to the farmer leaving the area) and 29 Farm Patterns were obtained from the 1971/72 season. In view of the significant variation in factors affecting the input picture, it was decided to present each farm's pattern separately since to average would have nullified the value of the information gained.

To provide an example of the information achieved by means of this survey technique, 3 of the Farm Patterns are given in Tables 13, 14 and 15.

The Farm Data Sheets can be presented in 'pull-out' form together with general information relating to each farmer to facilitate the presentation of a clear picture of the farmer's activities throughout the season.

For each of the farmer's fields, simple key letters are used to show the particular operations carried out and the tool used for each operation. (See Table 12).

Following the labour inputs per field, the total inputs per crop are provided; then an indication of the food availability pattern, followed by labour inputs for "Other work", "Livestock Activities" and the "Household/ Domestic" category.

The final part of each farmer's data sheet shows the combination of the various activities with man-hours equivalent input per activity occurring per 2-week period throughout the season in histogram form.

Table 1.

FARM-LEVEL SURVEY RECORDING METHOD

Zambia - GRZ/ITDG Farm Machinery Need Survey -
Southern Provinces - Tonga Plateau area.

Farm-level survey recording method

(1) Preliminary Investigation

To obtain a cross-section view of farming characteristics, 50 farmers were investigated in each of 3 selected areas for survey, their individual family composition and asset structure noted, from which information the sample farmers for survey were selected.

(2) (a) Daily Labour Record (per farm)



(b) Weekly Summary (per farm)

Note: Data from (b) can be put direct into the Year's Summary Sheets (per farm) but to facilitate cross-checking of figures and calculations it was put through the following steps:



(c) 2-week Summary sheets (per field per farm) and 2-week Summary sheets (livestock/household, per farm)



(d) Farm Pattern, year's Summary (inputs per field per farm)
Farm Pattern, year's Summary (inputs per crop/activity per farm)



(e) Significant inputs grouped together on Preliminary Totals Sheet, per farmer



(f) Farm Pattern, Year's Summary - Total Labour Distribution Histogram

2010 HISTORY - LOW POINT TOWNSHIP

NAME

VILLAGE

ADDITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
LOT																										
SECTION																										
TOWNSHIP																										
COUNTY																										
STATE																										
DATE																										
BY																										
REMARKS																										
APPROVED																										
DATE																										
BY																										
REMARKS																										
APPROVED																										
DATE																										
BY																										
REMARKS																										

2010 HISTORY - LOW POINT TOWNSHIP
 TABLE 6
 9

FARM MACHINERY NEED SURVEY

FARM PATTERN 1971-72

AGRIC. CAMP:

FARMER:

VILLAGE:

RAINFALL:MM

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
FIELD NO.	OP												
CROP:													
RC.	TE												
FIELD NO.	OP												
CROP:													
RC.	TE												
FIELD NO.	OP												
CROP:													
RC.	TE												
FIELD NO.	OP												
CROP:													
RC.	TE												
FIELD NO.	OP												
CROP:													
RC.	TE												
FIELD NO.	OP												
CROP:													
RC.	TE												

DISTRICT OFFICE - ANAND NIGRA
 1971

EXPLANATION OF SYMBOLS SHOWN 2 week PERIODS

FARMER'S NAME:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
DA																										
WF																										
V																										
VB																										
H																										
CH																										
SP																										
SOR																										
GN																										
M																										
L																										
D																										

Key: DA = off-farm work/reciprocal labour, WF = Winter Ploughing, V = Vegetables, VB = Velvet beans, H = Other Bean Crops
 CH = Cowpeas, SP = Sweet Potatoes, SOR = Sorghum, GN = Ground Nuts, M = Maize, L = Livestock, D = Domestic

510
480
450
420
390
360
330
300
270
240
210
180
150
120
90
60
30
0

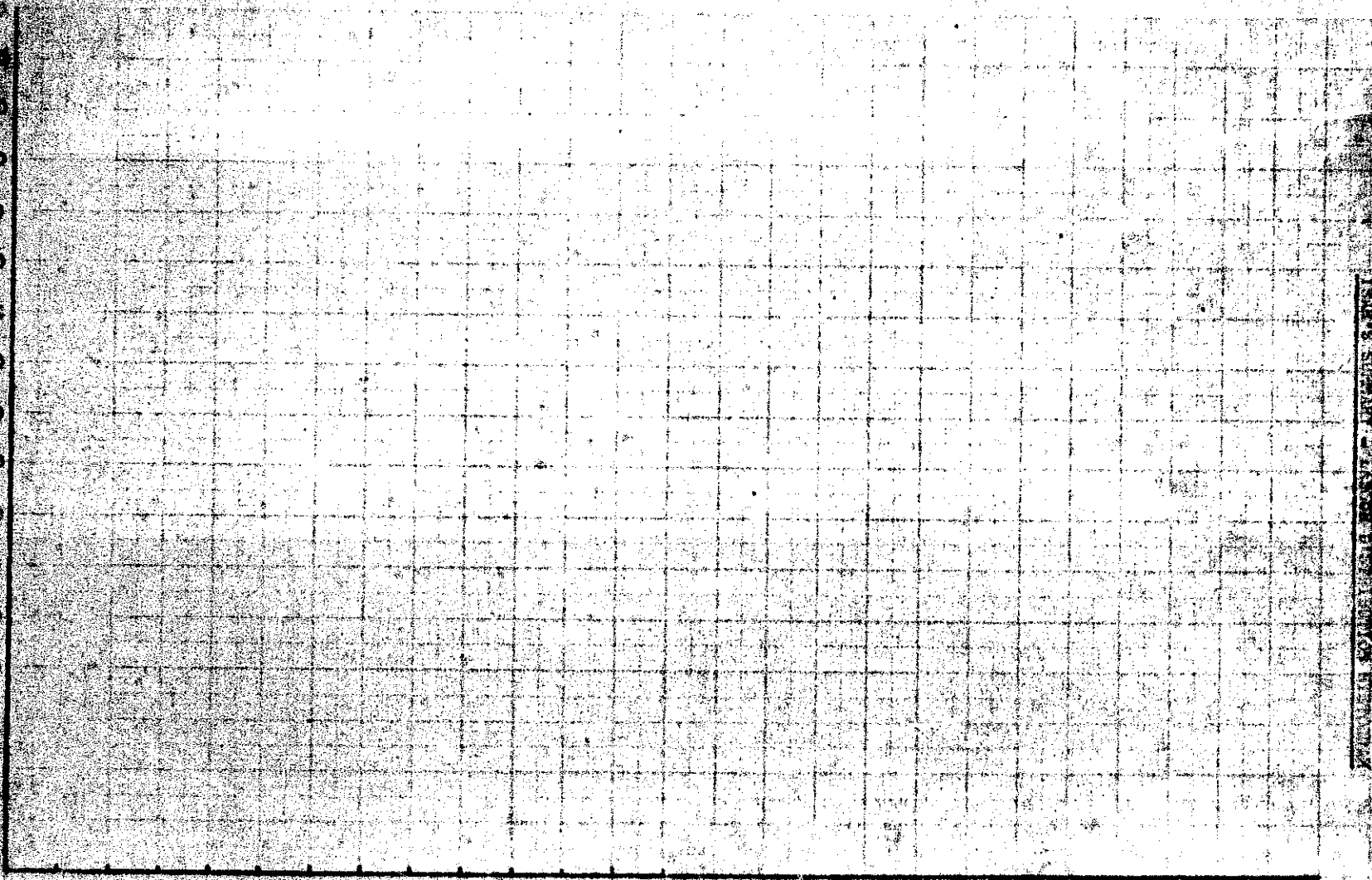


TABLE 1
ANNUAL SUMMARY OF REVENUE

TIME PERIOD : EACH DIVISION REPRESENTS TWO WEEKS.

GENERAL INFORMATION RELATING TO SURVEY FARMER

1971/72 SEASON

SURV. NUMBER:

FARMER'S CODE:

VILLAGE:

FAMILY LABOR

CLASS.	RATING	NUMBER	N.E. TOTAL
MAN, AGED 15-50	1-100		
WOMAN, AGED 15-50	1-100		
ELDERLY, AGE 50+	0-50		
YOUTH, AGE 12-15	0-50		
CHILD, AGE 5-12	0-25		
INFANT, UNDER 5 YRS	0		

TOTAL AVAILABLE MAN-EQUIVALENT RATING

OX-DRAWN EQUIPMENT USED

ITEM	OWNED	BORROWED	TOTAL
PLOUGH			
CULTIVATOR			
HARROW			
RIDGER			
PLANTER			
OX CART			

NUMBER OF FIELDS/FRAGMENTATION/ACREAGE

ACRES UNDER CROP	NUMBER OF FIELDS						TOTAL
	1	2	3	4	5	6	
MAIZE							
SOYABEANS							
WHEAT							
OTHER CROPS							
TOTAL							

LOCATION OF HOMESTEAD

DISTANCE TO:— (1) PRODUCE MARKET:
 (2) a. MAJORITY OF FIELDS: (2) b. FURTHEST FIELD:
 (3) MAIN ROAD: (4) AGRICULTURAL CAMP:

REMARKS:

YEAR'S MAN-HOURS INPUT PER ACTIVITY GROUPING

	MAIZE	OTHER CROPS	OTHER WORK	LIVE-STEAK	HOUSE-HELD	TOTAL
0/10						

Table 11.

Table 12.

KEYS TO SURVEY DATA SHEETS

ZAMBIA - GRZ/ITDC FARM MACHINERY NEED SURVEY

SOUTHERN PROVINCE - TONGA PLATEAU AREA

Keys to Survey Data Sheets

(a) Activities - Crops/fields

CB	-	Cutting bushes/clearing land
P/P	-	Ploughing and planting behind plough
P	-	Ploughing
PT	-	Planting (with planter)
CR	-	Planting (check row)
PR	-	Harrowing/planting (row dribble)
CP	-	Cultivator/planting (row dribble)
RP	-	Replanting by hand
RFP	-	Reploughing and planting
HR or HP	-	Hand-ridging/planting sweet potatoes
W	-	Weeding
C	-	Cultivating
R	-	Ridging
TD	-	Top dressing (fertiliser)
ED	-	Basal dressing (fertiliser)
CC	-	Collecting green cobs
HA	-	Harvesting
T	-	Transporting
L	-	Lifting (groundnuts)
ST	-	Stripping (groundnuts)
SH	-	Shelling maize/groundnuts
BA	-	Bagging (maize)
WT	-	weighing crops
CRM	-	Carting kraal manure
BDM	-	Broadcasting kraal manure
S	-	Storage
WP	-	winter ploughing
H	-	Harrowing

(continued on next page.)

Table 12 (continued).

(b) Activities - other than crops/fields

RCL	-	Reciprocal labour (on other farms)
PL	-	Paid employment (off farms)
TR	-	Treating livestock
HE	-	Herding livestock
S	-	Searching (collecting livestock)
KF	-	Herding cattle at the 'Kafue Flats'
BK	-	Building cattle kraal
HW	-	Housework
B	-	Building work
EM	-	Collecting/making building materials
Fw	-	Collecting firewood

(c) Equipment/Tools

Axe	-	axe
P	-	ox-plough
H	-	ox-harrow
HH	-	Hand-hoe
C	-	Ox-cultivator
R	-	Ox-ridger
SL	-	Sledge/ox-cart

(d) Food Pattern

C	-	Cereals
L	-	Legumes
GC	-	Green cobs
V	-	Vegetables
F	-	Fruit
R	-	Relish
S	-	Starch (sweet potatoes)

(e) 'Unallocated' - Vegetables

wa	-	Watering
W	-	Hand weeding
HP	-	Hand planting
HH	-	Hand hoeing

(f) Farm Pattern - Year's Summary

AC	-	Acres of field(s)
OP	-	Operation
TE	-	Tools/equipment
L	-	Labour input (man-hours)

- Notes: (1) Plots of crops such as sweet potatoes and vegetables are so small in area they are not recorded.
- (2) 'Unallocated' is used where collective shelling/weighing of crops from several fields is carried out at the homestead.

GENERAL INFORMATION RELATING TO SURVEY FARMER

1971/72 SEASON

SURVEY AREA: CHALIMMAN

FARMERS CODE: VB

VILLAGE: CHALIMMAN

FAMILY LABOUR

CLASS.	RATING	NUMBER	M.E. TOTAL
MAN, AGED 16-50	1.00	1	1.00
WOMAN, AGED 16-50	1.00	3	3.00
ELDERLY, AGED 50+	0.50		
YOUTH, AGED 12-15	0.50	1	0.50
CHILD, AGED 5-12	0.25	2	0.50
INFANT, UNDER 5 YRS	0	1	
TOTAL AVAILABLE MAN-EQUIVALENT RATING			5.00

ON-DRAWN EQUIPMENT USED

ITEM	OWNED	ON-RENT	TOTAL
PLOUGH			
CULTIVATOR			
HARROW	1		1
RIDGER			
PLANTER			
OX CART	1		1

NUMBER OF FIELDS/FRAGMENTATION/ACREAGE

ACRES	UNDER 1	1-2	2-3	3-4	4-5	5-6	OVER 6	TOTAL
NO.	4	3	1	1				9
MAIZE	0.45	2.01	2.40	3.15				11.01
GROUND NUTS	1.34							1.34
VELVET BEANS								
COW PEAS								
WINTER PLOUGH								
SORGHUM								
VEGETABLES								
TOTAL	1.89	2.01	2.40	3.15				12.45

LOCATION OF HOMESTEAD

DISTANCE TO: (1) PRODUCE MARKET: 10 KM
 (2) MAJORITY OF FIELDS: 1/2 KM (3) FURTHEST FIELD: 2 1/2 KM
 (4) MAIN ROAD: 20 KM (5) AGRICULTURAL CAMP: 4 KM

REMARKS:

The farmer has two wives. The eldest daughter, aged 17 years, is receiving full-time education at a boarding school and, therefore, not available to assist during the cropping season.

YEAR'S MAN-HOURS INPUT FOR ACTIVITY GROUPING

ACTIVITY	OWNED	ON-RENT	MAN-HOURS	TOTAL
	118	365	19	602
	77.55	515	19.5	1312

Table 13.

GENERAL INFORMATION RELATING TO SURVEY FARMER

1971/72 SEASON

SURVEY AREA: KATARA

FARMERS CODE: WC

VILLAGE: TUDALE

FAMILY LABOUR

CLASS.	RATING	NUMBER	M.E. TOTAL
MAN, AGED 15-50	1.00	1	1.00
WOMAN, AGED 15-50	1.00	2	2.00
ELDERLY, AGED 50+	0.50		
YOUTH, AGED 12-15	0.50	1	0.50
CHILD, AGED 5-12	0.25	3	0.75
INFANT, UNDER 5 YRS	0	1	
TOTAL AVAILABLE MAN-EQUIVALENT RATING			4.25

ON-DRAWN EQUIPMENT USED

ITEM	OWNED	BORROWED	TOTAL
PLOUGH	1		1
CULTIVATOR	1		1
HARROW			
RIDGER			
PLANTER			
ON CART		1	1

NUMBER OF FIELDS/FRAGMENTATION/ACREAGE

ACRES	NUMBER OF FIELDS/FRAGMENTATION/ACREAGE							TOTAL
	UNDER 1	1-2	2-3	3-4	4-5	5-6	OVER 6	
NO.	2	1			1			4
MAIZE	0.53	1.04			4.11			5.69
GROUND NUTS	0.54							0.54
VELVAT BEANS								
COVA BEANS								
WINTER PLOUGH								
SORGHUM								
VEGETABLES								
TOTAL	1.07	1.04			4.11			6.22

LOCATION OF HOMESTEAD

DISTANCE TO— (1) DISTRICT MARKET, KM
 (2) MARKET OF DISTRICT, KM (3) DISTRICT HEADQUARTERS, KM
 (4) MAIN ROAD, KM

REMARKS:

The farmer has one wife and a female relative living at the homestead. He has 11 cows, but one of the cows appears to be making special effort to use cattle manure on his fields.

YEAR'S FARMHOUSE INPUT AND ACTIVITY CREDITING

	MAIZE	OTHER CROPS	OTHER	LIVESTOCK	HOUSEHOLD	TOTAL
	5.69	0.54	1.92	7.81	10.07	35.77
100%	20.24	2.01	6.89	29.27	41.69	100

Table 14.

GENERAL INFORMATION RELATING TO SURVEY FARMER

1971/72 SEASON

SURVEY AREA: KATABA

FARMER CODE: YF

VILLAGE: MAINZA

FAMILY LABOUR

CLASS.	RATING	NUMBER	N.E. TOTAL
MAN, AGED 16-50	1.00	3	3.0
WOMEN, AGED 16-50	0.50	1	0.5
ELDERLY, AGED 50+	0.50		
YOUTH, AGED 12-15	0.50		
CHILD, AGED 5-12	0.25	1	0.25
INFANT, UNDER 5 YRS	0		
TOTAL AVAILABLE MAN-EQUIVALENT RATING			4.75

OX-DRAWN EQUIPMENT USED

ITEM	OWNED	BOBORNED	TOTAL
PLOUGH	1		1
CULTIVATOR		1	1
HARROW			
RIDGER			
PLANTER			
OX CART		1	1

NUMBER OF FIELDS/FRAGMENTATION/ACREAGE

ACRES	UNDER 1	1-2	2-3	3-4	4-5	5-6	OVER 6	TOTAL
NO.	3	1	2					6
MAIZE	0.47	1.11	4.10					5.68
GROUND NUTS	0.47							0.47
VEGETABLES								
COW-PEAS								
WINTER PLOUGH								
SORGHUM								
VEGETABLES	0.12							0.12
TOTAL	1.06	1.11	4.10					6.37

LOCATION OF HOMESTEAD

DISTANCE TO— (1) FARMER MARKET: 2 km
 (2) MAIN ROAD: 1 km (3) AGRICULTURAL CAMP: 1000m

REMARKS:

The farm was surveyed in the 1971/72 survey season. The land was owned by the farmer. Most of the land was planted with maize. The land was sold by the farmer to the government for the farm. The land was used for the farm. The land was used for the farm.

YEAR'S MEMBERS WANT FOR ACTIVITY GROUPING

MEMBER	WANT	WANT	WANT	WANT	TOTAL
1	1.06	1.11	4.10	0.12	6.37
2	1.06	1.11	4.10	0.12	6.37

Table 15.

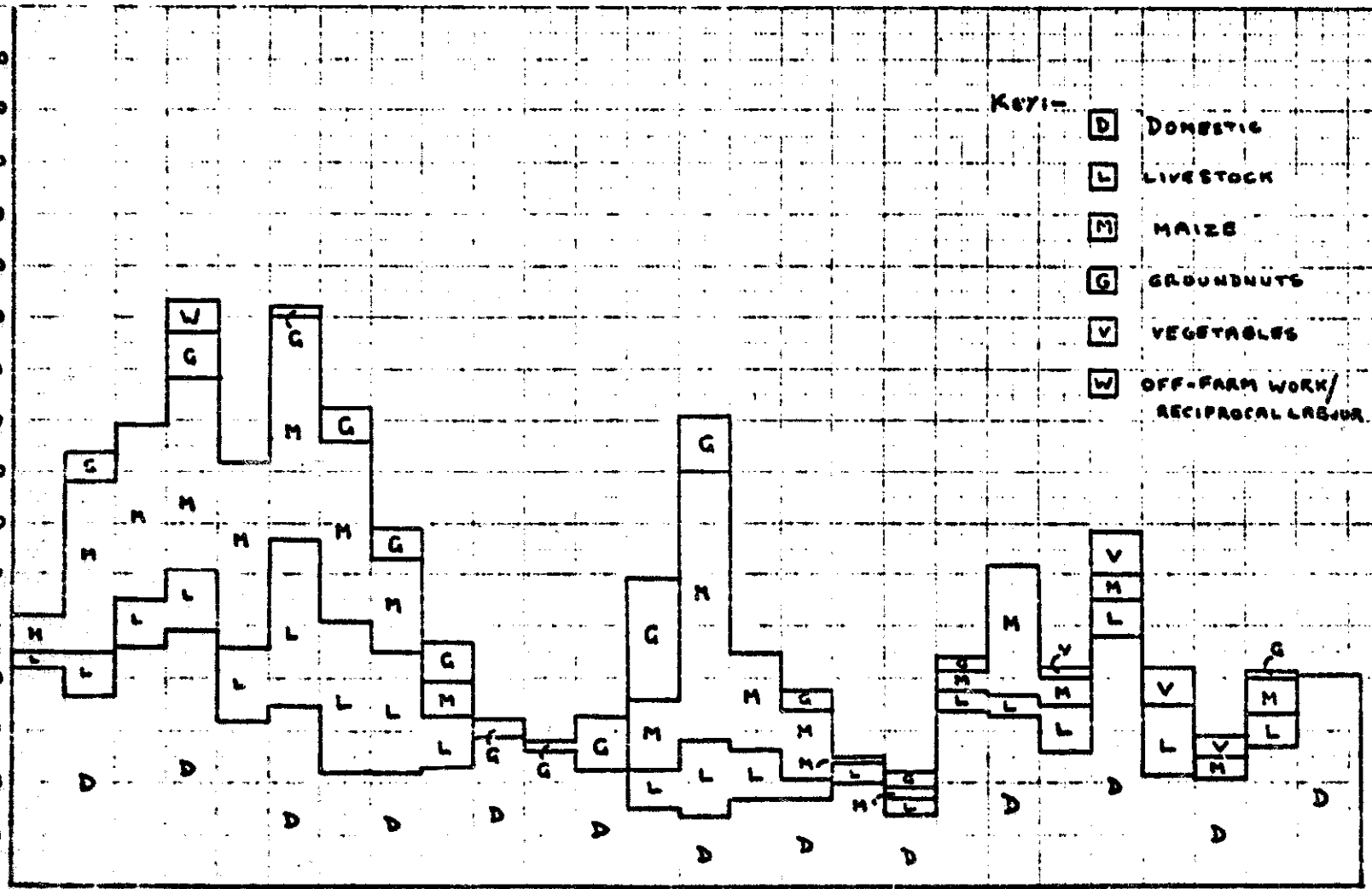
TOT. INPUTS PER CROP	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT																	
OPERATIONS MAIZE	CB	PP. N	PIP	PP. BDRP. W	W.C	W.C	W.C	W	GC				HA	HA	HA	HA/TD	CB	SH	SN	SN	SN	SN	SN	CB	CB	CB			
	C. BDLA. B9	W.C. N	C	TD	TD	TD							T/S	T/S	CB														
EC. 11-07	L	21	101	103	99	109	129	105	57	19	1	-	-	39	155	56	39	2	6	10	74	19	6	-	12	18	1	1181	
OPERATIONS BROWNUTS		PP		PP		W	W	W	W	W	W	W	L	L	ST	ST	ST		ST	ST						CB			
EC. 1-34	L	-	16	-	39	-	5	20	17	23	10	7	30	72	31	-	11	-	9	9	-	-	-	-	-	4	-	303	
OPERATIONS VEGETABLES																													
EC. 1-1	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	24	20	13	-	-	62
OPERATIONS																													
EC.	L																												
OPERATIONS																													
EC.	L																												
FOOD PATTERN		C	L	L	L	L	L	L	V	C	V	C	V	C	V	C	V	C	V	C	V	C	V	C	V	C	V	C	V
OTHER WORK		F	F	F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
INPUT	L	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
LIVESTOCK ACTIVITIES		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
INPUT	L	9	25	27	36	42	95	87	67	31	-	-	-	22	45	29	12	13	8	12	15	24	32	41	1	20	-	693	
HOUSEHOLD/ DOMESTIC																													
INPUT	L	126	109	137	147	95	106	66	67	68	86	79	68	45	41	51	50	59	43	102	96	78	143	64	62	81	121	2191	

MAN - HOURS EQUIVALENT INPUT

480
450
420
390
360
330
300
270
240
210
180
150
120
90
60
30

KEY:-

- D DOMESTIC LIVESTOCK
- F LIVESTOCK
- Z MAIZE
- G GROUNDNUTS
- V VEGETABLES
- W OFF-FARM WORK/ RECIPROCAL LABOUR



FARM MACHINERY NEED SURVEY

FARM PATTERN 1971-72

RCR.C. CAMP: KATABA

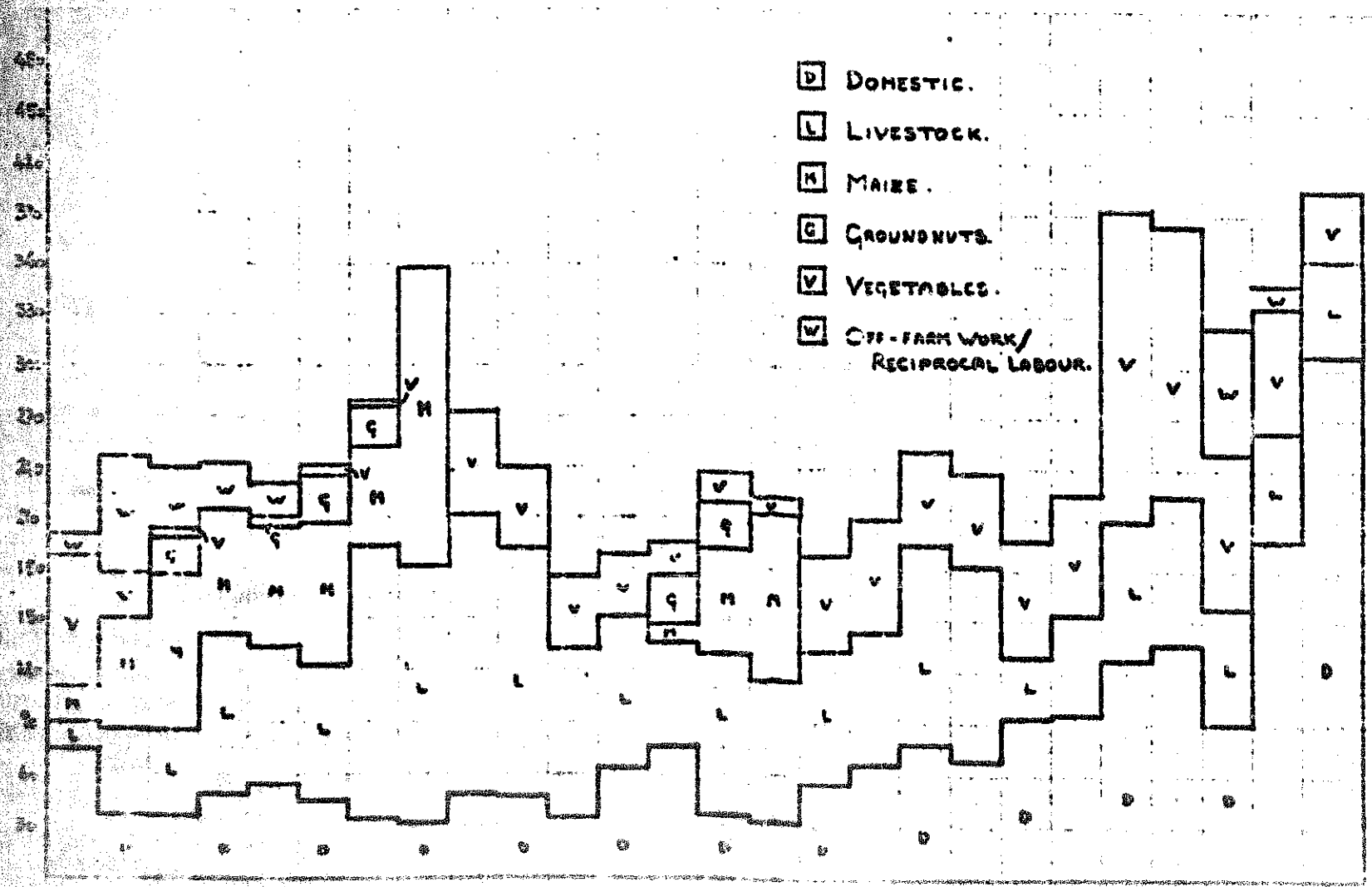
FARMER: XF

VILLAGE: MAINZA

RAINFALL (mm) 73.4 71.4 68.1 54.6 117.6 97.3 161.5 38 300 116.3 455 607 - - - - - 5.8 2.0 9090

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT															
FIELD NO.	OP	PP 20 PP 25 W 6 W 37 W 41 C 10						HA 7 HA 31																				
XF 1			C 40 C 12 C 6					T 3																				
CROP:			PP 22																									
MAIZE	TE	P	P	W	W	C	W	C		SL																		
RC. 133	L	20	25	32	50	47	10	-	-	-	-	-	-	225														
FIELD NO.	OP		PP 20 PP 26			W 4 W 38				HA 53																		
XF 2						C 16 C 6																						
CROP:						TD 4																						
MAIZE	TE		P	P		W	C	W	C																			
RC. 200	L	-	20	26	-	20	48	-	-	-	-	-	53	167														
FIELD NO.	OP		PP 20 PP 21 PP 15			C 16 W 58 W 81				HA 37																		
XF 3						C 10				T 8																		
CROP:																												
MAIZE	TE		P	P	P		C	W	W	C			SL															
RC. 210	L	-	20	21	15	-	16	58	91	-	-	-	45	266														
FIELD NO.	OP		PP 20			W 6 W 27 W 24				L 32 L 14																		
XF 4			PP 3							ST 11																		
CROP:																												
GROUNDNUTS	TE		P			W	W	W		W	W																	
RC. 049	L	-	-	23	-	6	27	24	-	-	-	-	32	25	137													
FIELD NO.	OP		P 12 PP 10 W 4 PP 10			W 85				HA 26																		
XF 5										T 3																		
CROP:																												
MAIZE	TE		P	P	W	P		W		SL																		
RC. 083	L	-	-	12	10	4	10	-	85	-	-	-	29	150														
FIELD NO.	OP	PP 27 W 5 W 2				W 7 W 4			PP 47 PP 23 PP 19 PP 29 PP 8 W 13 W 5 PP 22 PP 23 PP 14 W 45 W 57 PP 15 W 4 W 152 W 70 W 54 W 41																			
XF 6									W 14 W 24 W 26 W 8 W 6 W 5 W 4 W 16 W 11 W 11 W 36 HA 12 W 53 W 133 HA 8 HA 22 HA 21																			
CROP:		W 18							W 5				W 19 W 33 W 31 HA 3	W 4 HA 40														
VEGETABLES	TE	W																										
RC. 012	L	77	27	5	2	-	7	4	-	61	47	43	37	19	18	9	57	67	56	84	69	72	185	160	92	75	41	1314

MINIMUM EMPLOYMENT LEVEL



FARM MACHINERY NEED SURVEY

FARM PATTERN 1971-72

AGRIC. CAMP: KATABA

FARMER: WE

VILLAGE: TUNDAILE

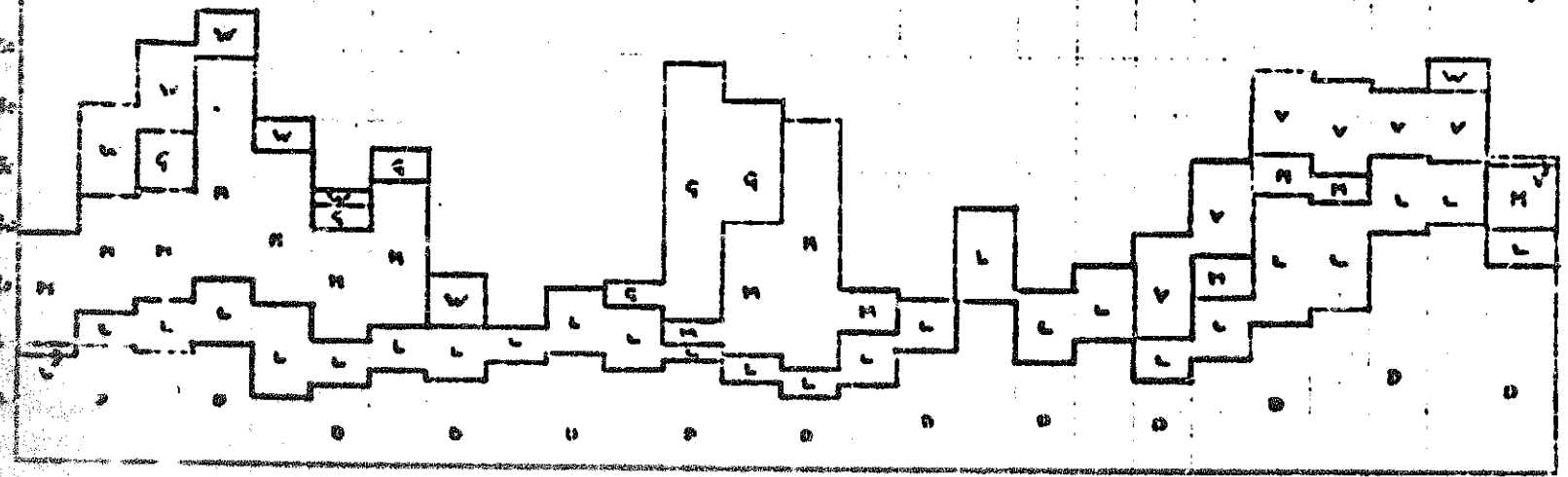
MINI FALL: mm 73.4 71.4 69.1 54.6 47.6 47.3 41.8 3.8 300 116.3 45.5 60.7 - - - - - - - - - - 5.8 2.0 9080

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	
FIELD NO.	OP	CKM P P P P P W W W W W					HA 12 HA 20 HA 20							
WE 1		24	15											
CROP:		P P 32												
MAIZE	TE	P P P	HH HH HH											
NO. OF	L	56 58	15 44	17 9			12 20 70							351
FIELD NO.	OP		P P 34		W 29 TD 13		HA 49 HA 31 S 23							
WE 2							T 10							
CROP:														
MAIZE	TE		P		HH		SL							
NO. OF	L	- -	39 -	- -	29 13	- -	49 41 22	- -	- -	- -	- -	- -	- -	193
FIELD NO.	OP		P P 18 W 40 W 12 W 60				HA 15							
WE 3					C 7									
CROP:														
MAIZE	TE		P	HH HH C HH										
NO. OF	L	- - -	18 60	19 60	- -	- -	- - 15	- -	- -	- -	- -	- -	- -	173
FIELD NO.	OP		P P 30		W 12 W 16		L 12 L 13 L 35							
WE 4							S 27							
CROP:														
MAIZE	TE		P		HH HH		HH HH HH							
NO. OF	L	- -	30 -	- -	12 16	- -	12 132 62	- -	- -	- -	- -	- -	- -	264
FIELD NO.	OP										HP 16 HP 6 W 5 W 3 W 27 W 30 HA 5			
WE 5											HA 36 HA 61 HA 25 HA 33 HA 6 W 2			
CROP:											HA 4 HA 13			
MAIZE	TE										HH HH HH HH			
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -	52 47 34 49 33 36 5			256
FIELD NO.	OP										CKM CKM CKM			
WE 6											21 20 16			33
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 7														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 8														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 9														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 10														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 11														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 12														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 13														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 14														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 15														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 16														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 17														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 18														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 19														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 20														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 21														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 22														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 23														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 24														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 25														
CROP:														
MAIZE	TE													
NO. OF	L	- - -	- -	- -	- -	- -	- -	- -	- -	- -				
FIELD NO.	OP													
WE 26														
CROP:														
MAIZE	TE													

1956-1957

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

- D DOMESTIC.
- L LIVESTOCK.
- M MAIZE.
- G GROUNDNUTS.
- V VEGETABLES
- W OTO - FARM WORK /
RECIPROCAL LABOUR.



SUMMARY AND CONCLUSIONS

In Part I of this paper, the need for investigation in depth was emphasized. During the 1971/72 season, field observation and discussions held with the farmers and local agricultural staff by the project personnel enabled information to be obtained concerning family members' individual responsibilities, extended family relationships, land holding/utilisation practices and the use of material assets which, together with the type of data shown in Tables 13, 14 and 15, allowed certain recommendations to be made and action programmes to be planned in line with the basic objectives of the project.

Furthermore, the material collected in the field during 1972 and 1973 provided valuable guidelines on which action is being taken in engineering development, farm-level testing and modification of equipment, and training procedures for initiating rural craftsmanship and small-scale local manufacture in rural areas.

In addition, on the broader issue of needs for land planning and improved farming methods on a rainfall - catchment - area basis, substantial ecological evidence was obtained and documented in 1973, and appropriate recommendations on this point made to the Zambia Government.

It is not intended that this paper include details of too many aspects arising from the overall project findings, but rather to deal specifically with the farm survey method.

Points such as the accuracy of the data obtained and the use of man-equivalents are all open to question in some degree. However, this paper has been purposely written in the hope that some part of its content will effectively assist those who are set on the task of trying to improve the environment of the many people in rural areas, and bearing this in mind the following can be concluded:

- (1) Simple cost and return relationships may well be misleading, as innovations usually have wider indications for the allocation of farm resources.
- (2) It is necessary that a comprehensive picture of a particular rural farming system be drawn up before attempting to decide