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PROGRESS REPORT

1986-87 COOPERATOR'S CROPPING PRACTICES SURVEY

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PREFACE

ATIP Progress Reports are prepared and circulated to make ATIP research findings easily available to GOB personnel and researchers interested in Botswana farming systems. A major objective of the Progress Report series is to make research findings available in a timely manner. These reports are not subject to professional review outside the Francistown team. Therefore, data and findings presented in the Progress Report series may be subject to further revision and should not be cited without permission of the authors.

This Progress Report presents information on the Cooperator's Survey administered to the participants of the Multiple Visit Surveys carried out in the villages of Matobo, Karapong and Mathangwane, Tutume Agricultural District, during the 1986-87 cropping season. The report covers information provided by the respondents concerning their cropping practices and, in some cases, presents comparative information on cropping practices from the 1983-84, 1984-85, and the 1985-86 cropping seasons. Researcher hypotheses or possible explanation of certain data are also presented. Views presented in this paper belong solely to the author and do not necessarily reflect those of the Department of Agricultural Research or the Ministry of Agriculture.

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1986-87 COOPERATOR'S CROPPING PRACTICES SURVEY

ABSTRACT

Twenty-nine farmers in the Tutume Agricultural District (TAD) participated in the Cooperator's Survey conducted by the ATIP Francistown staff. The survey was intended to identify major changes, if any, in the cropping practices area. This survey was done in conjunction with the Arable Rainfed Agricultural Programme (ARAP) and Drought Relief Assessment Survey. Both of these surveys were administered to the 29 cooperator farmers.

In 1982 a Census Frame Survey was done to obtain a list of 10 farmers from each of the three villages in the Tutume Agricultural District that were representative of the whole of the Tutume Agricultural District and would be willing to work with ATIP. Those ten farmers were selected on a stratified random basis. An adequate representation of male and female-headed households, and varying cattle ownership levels was desired. These farmers are called Cooperator farmers. Twenty-nine of the 30 originally selected participated in this year's Cooperator's Survey. They were asked questions about their cropping activities and any problems that they had encountered during the 1986-87 season.

The total average rainfall for the past season in all three villages was 316.7mm, 68 percent of the 30-year average. Moreover, the distribution of the rainfall was sporadic and the rains stopped very early. Farmers ploughed and planted less land this year than last year. Cattle was the primary form of draught power used and most farmers owned their traction or owned and hired in combination.

Ninety-seven percent of the 29 cooperator farmers in 1986-87 participated in the ARAP ploughing programme. Seventy-five percent of the cooperator farmers received seed through the Drought Relief Programme. Sixty-one percent of the farmers obtained a plough through ALDEP. The number of farmers relying on government subsidy programmes had increased from last year.

The overall average of this year's sorghum harvest was only 18 kg/household. Most farmers harvested less than one quarter of their field or else they did not harvest at all. Farmers listed poor rainfall, the persistent drought and bird damage as major factors preventing them from achieving a better yield.

OBJECTIVES

The objective of this survey was to continue the collection of information about the entire farm enterprise, in order to identify major trends and changes in farming practices over time in the Tutume Agricultural District.

JUSTIFICATION

In order to present any viable alternative technologies to farmers, which will enable them to increase their farm income without substantially increasing their risk or their investment, a continuing assessment of the farmer's current situation must be done. Time series data for the villages ATIP Francistown is interested in is crucial to ensuring that our research is as accurate as it can be.

APPROACH

To provide system monitoring several approaches were combined. Daily readings of temperature and rainfall were recorded at various on-farm and off-farm sites in Matobo, Mathangwane, and Marapong where ATIP Francistown conducts research.

The normal Mid-season and End-of-season Cooperator's Survey given in the past three years was modified this season to accommodate the ARAP and Drought Relief Assessment Survey. This survey came about when the National Food Strategy Group requested that the farming systems projects evaluate the impact of the government agricultural assistance programmes. ATIP participated in the development of this survey. It was given to the 29 cooperator farmers as well as 30 other farmers selected from the 1982 Census Frame Survey in the same manner, stratified random selection, as the original 30 -- now 29 because one farmer dropped out. Because the ARAP and Drought Relief Assessment Survey covered some of the material normally covered in the Cooperator's Surveys, it was decided to modify the Cooperator's Survey so that farmers were not answering the same questions twice.

The 29 farmers that were surveyed were from various socio-economic levels and represented both male and female-headed households. The Cooperator's Survey was administered during June 1987. The ARAP and Drought Relief Assessment Survey was administered during May 1987. This is the fourth year that a cooperator's survey has been done with the same farmers. In 1983-84 and 1984-85 the farmers cooperated in a Multiple Visit Survey and in 1985-86 a Cooperator's Survey. The results of these surveys are presented in the following papers: "1985-86 Cooperators' Cropping Practices Survey", ATIP PR F87-1 , "Farming System Research Activities at Francistown: Summary of Activities, 1983-85", ATIP PR 2 , "Agricultural Baseline Survey of Tutume District", ATIP WP 3.

In some cases the results from this year are compared with the preceding three cropping seasons, although this report is primarily concerned with the 1986-87 season. It is anticipated that a working paper will be written which deals with comparing the past four years.

This report contains four major sections; 1. Rainfall and Temperature data, 2. Production Practices, 3. Cropping Outcomes, and 4. Participation in Government Programmes. Production Practices includes subsections discussing draught power, areas ploughed/planted, crops planted, new varieties and ploughing practices, weeding, and equipment purchases. Cropping Outcomes includes harvest data and problems farmers had. Participation in Government Programmes primarily discusses the ploughing and seed programmes, but it also includes some discussion of destumping, fencing, weeding and row planting programmes.

1. RAINFALL AND TEMPERATURE DATA

The rainfall and temperature data is collected from 15 locations within the villages of Marapong, Matobo, and Mathangwane. [Appendix, Tables A1-A3 present rainfall and temperature data in more detail than in Table 1.1 below.]

TABLE 1.1: AVERAGE MONTHLY RAINFALL (mm) FOR MATOBO, MATHANGWANE, AND MARAPONG AND THE 30-YEAR AVERAGE, COOPERATOR'S SURVEY, FRANCISTOWN AREA, 1986-87

MONTHS	30-YEAR AVERAGE	MATOBO	MATHANGWANE	MARAPONG	3 VILLAGE AVERAGE
July	0	0	0	0	0
August	1	0	0	0	0
September	8	18	9	10	12
October	24	41	68	91	63
November	62	63	94	57	76
December	102	51	83	50	68
January	99	95	41	69	64
February	84	18	27	48	25
March	48	10	5	7	7
April	28	0	0	0	0
May	11	0	0	0	0
June	2	0	0	0	0
Total	465	296	325	332	313

The country was drought stricken for another year, making this the sixth year of drought. This year's rainfall was 68 percent of the 30-year average. The distribution of rainfall was sporadic. Farmers would receive a good amount of rainfall on one day and then nothing for two weeks or longer. These dry spells were characteristic of this past season.

The standard deviations for the months of October through February were relatively high. This indicates that the rainfall within villages was variable by location. There was a significant difference between the rains which fell in each village and the average rainfall for all three villages. Not all areas of Francistown received the same amount of rainfall and not all fields within a village received the same amount of rainfall (see Table A2 for more details). The total rainfall this year was 316.7 mm. The total rainfall for the planting season (December through April) was 162.8 mm. The rains were good in the early part of the season, October-December, but they also stopped early, (in March) causing the plants to die, unmatured, in the field.

2. PRODUCTION PRACTICES

2.1 DRAUGHT POWER

Overall, the primary source of traction was cattle. In Marapong four out of nine farmers used a combination of cattle and tractors. Table 2.1 shows the primary draught type used among the farmers in the Francistown area. The cattle categories can be broken up into three economic groups. The lower two categories (those with 0-15 cattle) can be considered as poor farmers. The middle category may be considered the middle class, and the upper two categories (those with over 36 head of cattle) could be called the rich farmers.

None of the farmers used donkeys. The rich and middle class farmers mainly used tractors and or a combination of cattle and tractors, and they usually owned their draught source. The poor farmers used mostly cattle and they used much more hiring and borrowing/cooperative type arrangements.

Table 2.2 shows how farmers managed to acquire their draught power, whether

they owned, borrowed/cooperated, or hired it in some combination. Most farmers owned their own source of draught power. Many farmers used their own draught power in combination with hiring draught. Poor farmers were equally divided between owning, borrowing/cooperative arrangements, and hiring.

TABLE 2.1: PRIMARY DRAUGHT TYPE USED, IN PERCENTAGES, ARAP AND DROUGHT RELIEF ASSESSMENT SURVEY, FRANCISTOWN COOPERATOR COOPERATOR FARMERS, 1986-87

VARIABLE	NBR.OF FARMERS	PRIMARY DRAUGHT TYPE: DONKEY	CATTLE	TRACTOR	CATTLE/ TRACTOR	DONKEY/ CATTLE	DONKEY/ TRACTOR
Total	28	0	54	11	21	4	11
VILLAGE:							
Matobo	10	0	80	0	10	0	10
Mathangwane	9	0	44	22	11	0	22
Marapong	9	0	33	11	44	11	33
SEX OF HOUSEHOLD HEAD:							
Male	18	0	50	17	11	5	17
Female	10	0	50	0	40	0	0
CATTLE OWNERSHIP:							
0 Cattle	4	0	50	0	25	0	25
1-15 Cattle	11	0	55	18	18	9	0
15-35 Cattle	8	0	75	0	13	0	13
36-70 Cattle	3	0	0	33	33	0	33
More than 70	2	0	0	50	50	0	0

TABLE 2.2: PRIMARY DRAUGHT ACCESS IN PERCENTAGES, ARAP AND DROUGHT RELIEF ASSESSMENT SURVEY, FRANCISTOWN COOPERATOR FARMERS, 1986-87

VARIABLE	NBR. OF FARMERS	PRIMARY DRAUGHT ACCESS: OWN	BORROW/ COOP	HIRE	OWN/ HIRE	BORROW/ HIRE
Total	28	43	18	4	29	7
VILLAGE:						
Matobo	10	40	10	10	30	10
Mathangwane	9	22	44	0	22	11
Marapong	9	67	0	0	33	0
SEX OF HOUSEHOLD HEAD:						
Male	18	56	11	0	28	6
Female	10	20	30	10	30	10
CATTLE OWNERSHIP:						
0 Cattle	4	0	50	0	25	25
1-15 Cattle	11	36	18	9	27	9
15-35 Cattle	3	67	0	0	33	0
36-70 Cattle	3	33	33	3	33	0
More than 70	2	100	0	0	0	0

In Mathangwane, the majority of farmers organized their traction by forming

a cooperative arrangement with other farmers. One possible explanation for this is that there may be a shortage of labour in that village. Farmers in the other two villages have not complained of a shortage of labour.

The trend over time is that, for the most part, farmers stay with the same traction type, although a few changes can be seen as far as access to traction is concerned [See Appendix, Table A4]. There is no consistent trend between villages, however within each village there are some changes. In Matobo, farmers seem to stay with the same traction type over the years. Eighty percent of the farmers used cattle in 1983-84 and eighty percent used cattle in 1986-87. They are, however, doing more hiring. If a farmer co-oped for his or her cattle in 1985-86, they tended to hire in 1986-87. Some of those who used their own traction in 1985-86 hired and owned in combination in 1986-87. There is a major trend towards hiring which may be due to the influence of ARAP.

In Mathangwane, most farmers stayed with their previous traction type, with a notable exception. Three farmers who had previously hired tractors for ploughing, are now using their own cattle. One possible explanation for this might be that if they used their own or co-oped for the cattle they would receive the P50 per hectare given to farmers through ARAP. If they hired tractor owners to do the ploughing, as they had in previous years, the money would go to the tractor owner.

In Marapong, also, farmers stayed with their traction type. These farmers hired tractors, much as they have done during the past years. They mostly used their own cattle in combination with hiring tractors. [Appendix A, Table A6, shows the type of draught power used and the source of draught power for the ATIP Cooperator farmers from 1983-87.]

It was hypothesized that many farmers used government assistance programmes to hire tractors to plough their fields. Half of our cooperator farmers hired tractors through ARAP. Less farmers in Matobo hired tractors because there are not very many tractors available in Matobo.

Female-headed households hired more tractors to plough their fields than male-headed households. Poor farmers hired more tractors to plough their fields than those farmers who own more cattle.

Starting from 1983-84 the trend toward using tractors has steadily increased until 1985-86 when there was a higher use of tractors than ever before. However, in 1986-87 tractor use took a slight decline. It is difficult to say whether farmers are changing their minds about tractors at this point or if the decline reflects farmer use of their own animals to obtain ARAP payments.

2.2 LANDS PLOUGHED/PLANTED THIS SEASON

When farmers were asked if they planted more land this year than the year before, many of them replied that they had. In Matobo eight out of ten said they planted more land, in Mathangwane seven out of ten said they planted more, and in Marapong seven out of nine said they had planted more land. However, when it came to measuring the actual areas, it was found that many of them had planted less land. In Matobo seven had increased their hectarage planted, in Mathangwane only five had increased their hectarage planted, and in Marapong only three had increased their hectarage planted. One possibility is that the enumerators are not accurately measuring the fields. The enumerators used a measuring wheel and a compass to find the area of each field. The information was put into the computer and if the closing error was more than 15 percent, the field was remeasured. The hectarage computations then are probably fairly accurate. A more likely possibility is that the farmers themselves do not have an accurate perception of how much they are planting. Farmers may look at the amount of

time they spent ploughing and planting and conclude that it relates to the amount of land they ploughed and planted. Perhaps this discussion will have some bearing on how accurate farmer recall data really is.

There was not much destumping or fencing done during the past year. In Matobo, no one destumped or fenced any land. In Mathangwane, one farmer destumped and two farmers fenced more land. Also, in Marapong, one farmer destumped and one farmer fenced more land.

TABLE 2.3: AREAS PLANTED BY VILLAGE, HEAD OF HOUSEHOLD, CATTLE OWNERSHIP, AND OVERALL AVERAGE, COOPERATORS SURVEY, FRANCISTOWN AREA, 1983-87.

	AREA 83-84 HECTARE	AREA 84-85 HECTARE	AREA 85-86 HECTARE	AREA 86-87 HECTARE	AVERAGE AREA HECTARE
Overall Average	4.8	7.0	5.7	5.2	5.7
Matobo	2.7	4.3	3.8	3.4	3.6
Mathangwane	2.9	6.5	5.5	5.2	5.0
Marapong	9.3	10.7	8.1	7.3	8.9
Male HH/a	5.8	7.8	6.5	6.6	6.7
Female HH	3.2	5.8	4.4	2.9	4.1
0 Cattle	1.1	2.0	2.4	2.3	2.0
1-15 Cattle	3.1	4.2	4.1	2.9	3.6
16-35 Cattle	5.1	8.0	6.7	7.0	6.7
36-70 Cattle	4.5	6.5	5.2	3.9	5.1
More than 70	20.8	23.4	17.0	18.1	21.3

a. HH = Head of household

Based on our calculated areas, Table 2.3 shows areas planted by village, for male and female-headed households, cattle ownership categories, and the overall average for the past four seasons. [Appendix, Table A5 has the areas listed by individual household and Table A6 has the percentage changes in areas from 1983 to 1987.]

The overall average for this past season is less than last year and less than the average of all four years. The only season which was worse than last year was the 1983-84 season.

As can be expected, those farmers with more cattle planted and ploughed more land. There was a substantial decrease in the amount of land female-headed households planted this year as compared to the years before and as compared to the male headed households.

The majority of the farmers started ploughing in November, did most of their ploughing in December, and finished ploughing in January. This was the same last year, which might mean that farmers are tied more to tradition than to rainfall patterns, since the rainfall patterns were different last year. This coming season should prove or disprove this hypothesis. Another reason for this pattern year after year may be because of some of the constraints farmers face, such as gathering livestock together for ploughing and making sure they are strong enough to plough.

Male and female-headed households, as well as households in all categories of cattle ownership, did their ploughing activities roughly during the same months as the overall average.

2.3 CROPS PLANTED

Amongst the ATIP cooperator farmers sorghum was the most planted crop. Millet was second, maize was third, and cowpeas were fourth. In each village, and among the various cattle categories, the breakdown was the same as the overall average. Female headed households planted more millet and cowpeas than male headed households. [Appendix, Table A7 gives more detail about which crops were planted.]

Fifty-nine percent of the farmers said that they did not have enough seed. Most of these farmers were in Matobo. Most farmers said that they did not have enough jugobean and groundnut seed, except in Marapong, where the farmers did not have enough maize seed.

Sixty-nine percent of the farmers, in all three villages, purchased seed. The most purchased seed was sorghum and watermelon. Ninety percent of the Matobo farmers purchased seed, 70 percent of the Mathangwane farmers purchased seed, and only 41 percent of the Marapong farmers.

2.4 NEW CROP VARIETIES AND PRACTICES

The majority of farmers stuck to their standard varieties. A few farmers attempted to use a new variety. The varieties which were tried were; Sorghum v.65D, Millet v.Serere 5a, Cowpeas v.Blackeye and v.ER7. Most of these trials were lost due to the drought.

The farmer who planted 65D said she could not see any difference, but that the plants had died young. Of the farmers who planted Blackeye, one said he saw no advantage or disadvantage and his plants also died young due to lack of rainfall. Another farmer said his plants did not germinate at all. The third farmer did get a crop and said the Blackeye produced more seed. Serere 5A was said to have matured early and ER7 showed no advantages or disadvantages because the plants died early. Most of these farmers said they would be willing to try these varieties again next year.

As far as new ploughing practices were concerned, most farmers who attempted double ploughing and row planting reported a difference in the growth of the plants. Double ploughing plots were said to germinate quickly, produce more grain, contain less weeds, and provided a better stand. One farmer did say it took more time to prepare double ploughed plots. The two farmers who tried row planting said the plants were more resistant to the sun and harvesting was easier. Some farmers in Matobo separated their crops this year and they found that through sole cropping, the plants grew well and harvesting was easier.

Only seven farmers said they tried something new. Four of these were in Marapong and three were in Matobo. Some farmers did introduce traditional varieties and/or ploughing practices but they did not test them more, maybe because they did not consider them new. Some farmers who were reinterviewed were asked why they did not try any new cropping techniques or varieties. One farmer responded that she did try double ploughing cowpeas and millet, but she did not list it when she was originally interviewed. Many of the Cooperator farmers belong to the ATIP farmer groups which are constantly testing new varieties and cropping methods. The question may cause some confusion among the farmers and the enumerators as it is not clear whether farmers are including their farmer group plots or not. And also whether they are including something they normally do over their entire field as new, such as double ploughing or row planting.

2.5 WEEDING

Seventy-six percent of the cooperator farmers weeded all of the plots they planted at least once. Only seven percent weeded them a second time. Of the farmers who did not weed at all, most of them said it was because too few plants established and that many of their plants died due to the drought. One farmer said that he/she did not get any weeds, because the rainfall was so low, nothing grew.

The distribution of those who weeded is fairly even among villages. Male headed households did more weeding than female-headed households. Eighty-nine percent of the male headed households weeded all of the plots they planted, whereas only 54 percent of the female-headed households did.

2.6 PURCHASE OF EQUIPMENT

Most of the farmers in Matobo and Marapong purchased plough parts. None of the cooperator farmers in Mathangwane purchased any equipment. Of those who purchased the plough parts, 46 percent said it was because they did not have any, 31 percent said the parts they had were broken, and 23 percent said that their share was too dull. There is no place in any of the three villages to have plough parts repaired, thus the only alternative is to purchase new ones.

3. CROPPING OUTCOMES

3.1 HARVEST DATA

The harvest during the 1986-87 season was very low compared to the average of the past four seasons. The average amount of sorghum harvested was 19 kg/household. The average sorghum harvest for the past four seasons was 336 kg/ household.

TABLE 3.1: HARVEST OF SORGHUM, MILLET, MAIZE, AND COWPEAS, COOPERATOR'S SURVEY, FRANCISTOWN AREA, 1986-87 (KG/Household)

	SORG 1986-7	MILL 1986-7	MAIZ 1986-7	COWP 1986-7
OVERALL AVG.	18	57	1	3
VILLAGE:				
Matobo	10	4	0	0
Mathangwane	15	18	0	2
Marapong	27	155	10	7
SEX OF HH:				
Male HH	16	79	4	5
Female HH	23	20	2	2
CATTLE OWNERSHIP:				
0 Cattle	5	3	0	1
1-15 Cattle	14	15	0	3
16-35 Cattle	15	91	4	8
36-70 Cattle	32	212	0	0
> 70 Cattle	50	8	30	0

HH = Head of Household SORG = Sorghum
MILL = Millet Maiz = Maize COWP = Cowpeas

Table 3.1 shows the harves of sorghum, maize, millet and cowpeas for the 1986-87 season. Appendix, Table A8 gives the harvest of the four most planted crops by individual household and compares this year to an average of the last four seasons.

TABLE 3.2: COMBINED GRAIN YIELS OF SORGHUM AND MILLET, COOPERATOR'S SURVEY, FRANCISTOWN AREA, 1983-87

	1983-84	1984-85	1985-86	1986-87
OVERALL AVERAGE	320	1457	272	75
VILLAGE:				
Matobo	66	592	460	14
Mathangwane	482	1055	150	33
Marapong	441	2092	144	182
SEX OF HOUSEHOLD HEAD:				
Male	292	1741	180	95
Female	376	846	440	43
CATTLE OWNERSHIP:				
0 Cattle	75	123	38	6
1-15 Cattle	121	696	110	33
16-35 Cattle	364	1254	569	105
36-70 Cattle	51	2043	1487	243
> 70 Cattle	2040	9560	342	58

TABLE 3.3: PERCENTAGE OF TOTAL AREA HARVESTED, COOPERATOR'S SURVEY, FRANCISTOWN AREA, 1985-86

	PART OF TOTAL AREA HARVESTED					
	ALL	>3/4	3/4-1/2	1/2-1/4	<1/4	NONE
TOTAL:	0	7	14	11	46	21
VILLAGE:						
Matobo	0	0	0	0	50	50
Mathangwane	0	0	11	0	78	11
Marapong	0	22	33	33	11	0
SEX OF HOUSEHOLD HEAD:						
Male	0	11	11	6	50	20
Female	0	0	20	20	40	20
CATTLE OWNERSHIP:						
0 Cattle	0	0	0	0	75	25
1-15 Cattle	0	0	9	18	45	27
16-35 Cattle	0	12	25	0	38	25
36-70 Cattle	0	0	0	33	67	0
> 70 Cattle	0	50	50	0	100	0

Over half of the cooperator farmers harvested less than one quarter of their land this past season and no farmers harvested all of their land. Fifty percent of the farmers in Matobo did not harvest any of their land. Male

and female-headed households were fairly similar when it came to the amount of land they harvested. Those farmers who owned fewer cattle also harvested a lower percentage of their land. Table 3.3 shows the percentage of total area harvested.

Only one farmer sold any harvest. He/she sold three bags of sorghum for P30-40/bag. None of the other farmers sold any of their harvest.

3.2 CROPPING PROBLEMS IDENTIFIED

Table 3.4 show the problems farmers said they had which prevented them from getting a better yield. The majority of the problems in Table 3.4 result from a lack of labour. Preventing bird and livestock damage require someone to be in the field scarring the animals away. Too many weeds, lack of destumped land and of course ploughing labour, obviously refer to the problem of obtaining labour. These problems most likely do not extend from the lack of money. There are government assistance programes which can help a farmer with weeding, destumping and ploughing money. Many of the cooperator farmers do take advantage of these programes. The fact that they still list them as problems indicates that there is more to it than just being able to afford to hire someone.

If a farmer chooses not to participate in a government scheme and still lists these problems then there may be something wrong with the way the government schemes are implemented. Perhaps farmers are unaware of them, although at this stage that is doubtful. Farmers perceive the programmes as too complicated or maybe the government programmes do not solve the problems of farmers. These questions can not be answered from this survey.

Several of the problems mentioned by farmers were of an uncontrollable nature, such as poor rainfall. Farmer sickness and wild animal damage would probably fit into this category as well.

Poor plant establishment can be a result of several factors. Poor management on the part of the farmer, poor seed quality, or poor post planting conditions can all contribute to poor stands. Poor management can be handled by more education for the farmer. Poor planting conditions are for the most part uncontrollable.

TABLE 3.4: FACTORS WHICH PREVENTED FARMERS FROM GETTING GREATER CROP PRODUCTION (percent), COOPERATORS' SURVEY, FRANCISTOWN AREA, 1986-87

FACTORS	TOTAL	VILLAGE: MATO	MATH	MARA	SEX OF HEAD OF HHD: MALE	FEMALE	CATTLE OWNERSHIP: 0	1-15	16-35	36-70	> 70
Poor Rain	100	100	100	100	100	100	100	100	100	100	100
Drought	79	100	67	67	86	70	75	80	67	100	0
Bird Damage	64	80	44	67	71	60	50	73	38	100	50
Livestock Damage	43	40	44	44	50	30	50	36	63	0	50
Too Many Weeds	36	20	0	78	33	30	0	55	12	22	50
Wild Animal Damage	29	20	22	44	33	20	25	36	25	0	50
Poor Plant Establishment	21	10	33	22	17	30	25	18	25	33	0
Farmer Sickness	21	20	22	22	33	0	25	27	12	0	50
Lack of Drought	16	0	22	33	11	30	25	27	0	0	50
Not Enough Land Destumped	14	0	0	44	11	20	0	18	25	0	0
Lack of Labour for Ploughing	11	10	0	22	11	10	0	9	25	0	0

4. PARTICIPATION IN GOVERNMENT PROGRAMMES

Ninety-seven percent of the 29 cooperator farmers in 1986-87 participated in the ARAP ploughing programme. Seventy-five percent of the cooperator farmers received seed through the Drought Relief Programme. Sixty-one percent of the farmers obtained a plough through ALDEP. The number of farmers relying on government subsidy programmes has increased from last year. [See Appendix, Table A9] The following discussion addresses each programme separately.

4.1 PLOUGHING

The ARAP ploughing subsidy was by far the most popular. Twenty-six of the 28 cooperator farmers who ploughed used ARAP. Seventy percent of the farmers in Mathangwane also used Drought Relief as well as ARAP.

Farmers were asked whether they would have ploughed more land, less land or the same amount of land without the ploughing subsidies. Seven farmers said they would plough more land. Fifteen farmers said they would plough the same amount. Five farmers said they would plough less and one farmer was not sure what he would do. The difference between those who said they would plough more and those who said they would plant less is not significant. Over half of the farmers, 54 percent, said they would plough the same amount without the government ploughing scheme.

Many people question whether farmers are actually planting all of the land they plough. This survey shows that most people do. Only one farmer, in Marapong, did not do any planting at all.

Fifteen farmers out of the 28 involved in the government scheme, hired a tractor to plough for them. Seventy percent hired tractors in Mathangwane and only 30 percent hired tractors in Matobo. In Marapong, half hired tractors and half ploughed with their own animals. Most farmers were pleased with the tractor service in their village, however there was not a significant difference between those who were pleased and those who were dissatisfied.

The average payment made to a tractor owner was P55/ha. The majority of the farmers paid exactly what they received through the subsidy. Only six out of the 15 farmers who hired a tractor had to pay additional money out of pocket. The amount they paid over the P50/ha ranged from P5/ha to P25/ha.

There has been a substantial increase in the number of farmers who apply for government ploughing assistance since 1982-83 season. In 1985-86, only 19 farmers out of the 28 relied on government subsidies. Before that only 2 out of the 28 farmers participated in Drought Relief [then the only programme].

4.2 SEED

The seed subsidy was probably the second favourite programme of the ATIP cooperator farmers. Fifty-four percent of the farmers said they participated in the ARAP seed programme and seventy-five percent said they participated in the Drought Relief programme. Some farmers responded that they used both ARAP and Drought Relief seed, but this is not possible. Other farmers said they used ARAP seed in 1982-83, and the ARAP programme did not exist until 1984-85. These responses were added to the don't know category.

In Matobo, 77 percent of the farmers used Drought Relief seed, no one used

ARAP seed. In Mathangwane it was just the opposite, 77 percent used ARAP seed, and no one used Drought Relief seed. In Mathangwane, it was about half and half for the 1986-87 season. The number of farmers who collected government seed has increased over the years, but only slightly. A fair number of farmers have been receiving seed subsidies since 1982-83 from Drought Relief.

Farmers were asked which seed they thought was the most important to be included in a government programme. The answers were quite varied from farmer to farmer. Table 4.1 shows what farmers said were the top three varieties which should be included in any government seed programme.

TABLE 4.1: TOP THREE CROP/VARIETIES* WHICH SHOULD BE INCLUDED IN ANY GOVERNMENT SEED PROGRAMME, ARAP AND DROUGHT RELIEF ASSESSMENT SURVEY, FRANCISTOWN AREA, 1986-87

	FIRST IMPORTANT	SECOND IMPORTANT	THIRD IMPORTANT
Sagadane	6	4	1
Maize	5	5	4
K. E. P.**	1		1
Millet	5	2	2
Serere 8A	2	4	2
Cowpeas	3	2	10
Blackeye		5	2
Groundnuts	3	2	5
Jugobeans	1	4	1

* When farmers were asked which was the most important crop/variety some responded with a variety and other with a crop, so both are included in this table.

** K.E.P. = Kalahari Early Pearl

4.3 DESTUMPING

From the 1982-83 season to the 1984-85 season, the rate of destumping was fairly constant. A few farmers took advantage of the ALDEP destumping scheme, but many just destumped on their own. In 1985, however, the amount of destumping increased. This was due to the ARAP programme. It was possibly better advertised than the ALDEP programme was in 1982/84 or possibly ARAP has better matching requirements. During the 1986-87 season, very few farmers did any destumping and, of those who did, they did it on their own.

It is interesting to note, that when farmers were asked if they had any more land they would like to destump, over half said that they did. Most of the farmers that used a government programme to destump, did plough and plant the area destumped.

4.5 FENCING

Over half of the cooperator farmers have made no improvements to their fences since the drought began. Eight of those farmers who did make improvements did it on their own. Only three farmers used an ALDEP fencing package.

4.6 WEEDING

In 1985-86, 19 farmers out of the 29 cooperator farmers applied to ARAP for a weeding subsidy. Only 10 of those farmers received payments as of July 1987. In addition, one person had hired someone to do the weeding and

he/she was satisfied with the work.

4.7 ROW PLANTING

Two farmers in Matcbo and two farmers in Mathangwane row planted during the 1986-87 season. None of these farmers used a government subsidy. In Marapong four farmers row planted, only one used ARAP and the farmer did not hire anyone to do the row planting for him.

5. CONCLUSIONS

The amount of land planted was closely related to the amount of cattle a farmer owned and whether the household was male or female-headed. The more cattle a farmer owned the more land they were apt to plant. They were likely to use their own cattle and/or tractors to plough their fields. Female-headed households were more likely to hire their draught power and to plant less land. In addition, female-headed households participated less in government schemes. From the 1986-87 season several observations stand out:

a. People planted on average 6 hectares.
b. The primary source of traction was cattle.
c. Most farmers owned their own draught source.
d. Millet was viewed by farmers as the most important crop to be included in any government programme.
e. The highest yields were achieved with millet.
f. Farmers harvested less than one quarter of the area they planted.
g. The average sorghum harvest was 18 kg/household.
h. Almost 100 percent of the farmers participated in the ploughing programme under ARAP and three fourths received seed through Drought Relief.

APPENDIX

TABLE A1: MONTHLY RAINFALL (MM), COOPERATOR'S SURVEY
FRANCISTOWN AREA, 1983-86

	FRANCISTOWN	THREE TUTUME VILLAGE AVERAGE							
	30 YEAR	1983-1984		1984-1985		1985-1986		1986-1987	
MONTH	AVERAGE	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
July	0.5	0	0	0	0	0	0	0	0
August	0.6	0	0	0	0	0	0	0	0
September	7.9	0	0	0	0	0	0	12.4efgh	4.8
October	24.3	NA	NA	34.3a	15.7	27.9	13.5	62.7agh	20.2
November	61.7	NA	NA	75.6d	40.6	14.1ad	16.2	76.1h	26.3
December	101.6	21.9ec	12.4	45.1ec	16.9	34.4a	34.6	65.9af	25.1
January	98.7	33.7ac	12.6	136.5acd	41.8	31.3a	13.5	64.4efgh	25.5
February	83.5	50.1acc	25.9	133.6acd	27.7	32.8ade	10.0	25.4afgh	14.5
March	46.1	77.0ece	0.1	18.3acc	24.3	59.4ade	14.5	7.1afgh	4.1
April	25.8	12.7ace	11.6	0cd	0	117.6ade	36.9	0	0
May	10.9	0	0	0	0	0	0	0	0
June	2.2	0	0	0	0	0	0	0	0
TOTAL Total (Dec-Apr)	464.1			447.8b	65.4	316.1	128.3	316.7	37.4
	355.8	192.4ac	48.1	337.9c	55.8	266.8	85.9	162.8eg	29.0

a. Significantly different (P < .01) from 30 year average.
b. Significantly different (P < .05) from 30 year average.
c. Significant difference (P < .01) between 83-84 and 84-85.
d. Significant difference (P < .01) between 84-85 and 85-86.
e. Significant difference (P < .01) between 83-84 and 85-86.
f. Significant difference (P < .01) between 83-84 and 86-87.
g. Significant difference (P < .01) between 84-85 and 86-87.
h. Significant difference (P < .01) between 85-86 and 86-87.

TABLE A2: MONTHLY RAINFALL (MM), COOPERATOR'S SURVEY, FRANCISTOWN AREA, 1983-88

MONTH*	1983-1984 MEAN	S.D.	1984-1985 MEAN	S.D.	1985-1986 MEAN	S.D.	1986-1987 MEAN	S.D.
MATOBO:	n = 9		n = 10		n = 10		n = 5	
September	NA	NA	NA	NA	NA	NA	19.4	3.3c
October	NA	NA	17.3a	5.5	41.6	8.2	40.8	8.1c
November	NA	NA	118.7a	31.9	0	0	62.6	9.4
December	31.4	9.6	38.2a	9.7	46.0	54.5	50.8	22.3d
January	28.9	4.5	113.8a	14.9	37.8	14.4	95.0	17.9c
February	52.5	10.2	126.1	19.1	34.2	11.3	18.0	4.2d
March	74.0a	2.5	43.2b	26.7	52.0	20.3	9.8	3.6d
April	0	0	0	0	74.2	20.3	0	0
TOTAL MATO	188.8b	26.8	455.3	59.6	285.8	67.0	295.4	44.9
MATHANGWANE:	n = 8		n = 10		n = 10		n = 7	
September	NA	NA	NA	NA	NA	NA	9.3	1.1d
October	NA	NA	42.1b	6.5	29.3	8.6	68.4	8.5
November	NA	NA	44.4a	12.1	30.8	14.5	93.7	29.1d
December	14.6	12.6	63.1b	18.4	23.7	16.4	83.4	17.4d
January	24.0	12.8	184.7a	48.3	28.3	8.4	43.7	17.7c
February	21.8a	12.6	141.7	36.0	32.7	5.3	25.6	8.1
March	76.9	4.1	0	0	66.9b	7.9	5.1	3.9
April	16.0	12.0	0	0	148.0b	23.0	0	0
TOTAL MATH	159.1a	38.7	476.0	52.5	357.7	46.1	325.2	38.0
MARAPONG:	n = 8		n = 9		n = 9		n = 3	
September	NA	NA	43.5	15.4	15.8	14.3	33.7	13.3c
October	NA	NA	53.6	23.2	1.2	2.0	57.3	3.1d
November	19.8	3.9	48.0	7.4	38.7	23.9	50.0	20.8d
December	39.3	12.9	111.8	35.3	27.7	24.0	58.7	13.0
January	73.3b	24.3	132.9	23.3	30.7	17.1	48.3	15.3c
February	20.0	9.1	11.6a	3.2	34.3	22.1	7.3	3.3
March	22.0a	3.4	0	0	123.6	23.6	0	0
April								
TOTAL MARA	234.4b	39.6	411.4	57.1	291.0	47.4	332.0	11.0
3 VILL TTL	132.4	43.1	447.7	65.4	316.1	128.3	316.7	37.4

* Months not indicated had insignificant rainfall.
a. Significantly different (P < .01) from 3 village average, same year.
b. Significantly different (P < .05) from 3 village average, same year.
c. Significantly different (P < .01) from 3 village average, same year.
d. Significantly different (P < .05) from 3 village average, same year.

TABLE A3 RECORDED MONTHLY AVERAGE MAXIMUM AND MINIMUM TEMPERATURES (CENTIGRADE), MATOBO, 1986-87

	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Av. Max	33.3	33.8	34.7	33.0	36.0	35.0	36.8	36.8	32.5	30.1	15.0	21.4
Av. Min	12.6	16.1	18.4	18.9	19.3	20.1	13.3	17.2	13.7	12.7	13.7	15.4

TABLE A4: TYPE OF DROUGHT POWER USED AND SOURCE OF DRAUGHT POWER, COOPERATORS SURVEY, FRANCISTOWN AREA, 1983-87

FARMER NUMBER	---DRAUGHT--- TYPE/a 1983-84	ACCESS/b 1983-84	---DRAUGHT--- TYPE 1984-85	ACCESS 1984-85	---DRAUGHT--- TYPE 1985-86	ACCESS 1985-86	---DRAUGHT--- TYPE 1986-87	ACCESS 1986-87
Matobo								
1	C	O	C	C	C	C	C	OH
2	C	O	C	O	C	O	C	O
3	C	C	C	C	C	C	C	H
4	C	O	C	O	C	O	C	O
5	C	O	C	C	C	O	C	C
6	C	O	C	O	C	O	C	OH
7	C	O	C	O	C	O	C	O
8	C	H-B	C	O	C	F	C	BH
9	T-C	H-O	T-C	H	C-T	F-H	CT	B
10	O	O	O	O-H	O	O	OT	OH
Mathangwane								
11	T	H	T-C	H-H	C-T	H-H	CT	B
12	-	-	T	H	-	-	-	-
13	O	O	O-T	O-H	O-T	O-H	OT	OH
14	O-T	O-H	O-T	O-H	O-T	O-H	OT	OH
15	C	F	C	C	C	C	C	BH
16	C-T	O-H	C-T	O-H	C-T	O-H	T	B
17	C-T	C-H	T-O	H-O	T	H	C	O
18	C	O	O	C	C-T	H	C	O
19	-	-	-		C	H	C	O
20	C-T	C-H	C-T	O-H	O-T	O-H	OC	O
Marapong								
21	C	O-B	C	O	C-T	O-H	C	O
22	C	O	C-O	O-O	C	C	C	O
23	C-T-O	O-H-O	C-O-T	O-O-H	O-C	C-O	C	O
24	C-O	C-O	C-O	O-O	C-T	O-H	OC	O
25	T	H	T-C	H-H	C-T	H-H	CT	OH
26	T-C	H-O	C-T	O-H	O-C	O-H	CT	OH
27	T	C-C-O	T-O	O-C	T	O	T	O
28	C-O-T	O-O-H	C-T	O-H	O-T	C-H	CT	O
29	T-O-C	H-B-O	C-T	C-H	C-T	O-H	CT	OH

a.Draught Type: C=Cattle, O=Donkey, T=Tractor
CT=Cattle & Tractor, OC=Donkey & Cattle OT=Donkey & Tractor
b.Access: O=Own, B=Borrow and/or Coop arrangement, F=Family, H=Hire
OH=Own & Hire BH=Borrow & Hire

TABLE A5: AREA PLANTED BY HOUSEHOLD, COOPERATORS SURVEY FRANCISTOWN AREA, 1983-87.

FARMER NO.	AREA 83-84 HECTARE	AREA 84-85 HECTARE	AREA 85-86 HECTARE	AREA 86-87 HECTARE	AVERAGE AREA HECTARE
MATOBO					
1	1.8	2.7	2.4	2.1	2.3
2	3.0	5.6	5.5	5.7	5.0
3	1.6	4.0	1.6	1.8	2.3
4	4.2	5.8	5.8	5.9	5.4
5	4.7	4.2	3.3	4.6	4.2
6	2.6	10.2	9.1	3.3	6.3
7	2.1	2.4	3.1	1.4	2.3
8	1.2	1.3	1.2	2.3	1.5
9	4.1	3.4	3.0	3.4	3.5
10	1.9	3.5	3.3	3.1	3.0
Mathangwane					
11	1.1	2.6	2.1	2.5	2.1
12	0	1.9	0	0	.5
13	1.7	3.6	5.3	3.6	3.6
14	5.5	10.6	9.8	12.5	9.6
15	1.6	1.9	1.8	2.2	1.5
16	1.3	5.0	6.1	3.1	3.9
17	11.1	25.4	15.2	7.2	14.7
18	.9	3.1	4.4	2.3	2.7
19	0	0	.5	.5	.4
20	5.7	11.0	9.5	17.7	11.0
Marapong					
21	8.2	8.9	8.3	2.9	7.1
22	6.8	5.2	8.3	2.6	6.5
23	9.9	10.6	.9	4.3	6.6
24	7.7	8.9	8.4	2.7	6.5
25	2.3	1.3	.6	2.7	1.8
26	4.0	4.5	6.2	5.7	5.2
27	7.4	12.5	9.4	5.3	6.7
28	30.4	33.5	16.6/b	29.0	26.0
29	6.8	7.3	11.4	9.9	8.9
Overall Average	4.8	7.0	5.0	5.2	5.7
Matobo	2.7	4.3	3.8	3.4	3.6
Mathangwane	2.9	6.5	5.5	5.2	5.0
Marapong	9.3	10.7	9.0	7.3	8.9
Male HH/a	5.6	7.8	6.9	6.6	6.7
Female HH	3.2	5.8	4.4	2.9	4.1
0 Cattle	1.1	2.0	2.4	2.3	2.0
1-15 Cattle	3.1	4.2	2.4	2.9	3.6
16-35 Cattle	5.1	8.0	7.6	7.0	6.7
36-70 Cattle	4.5	6.5	5.2	3.9	5.1
More than 70	20.8	29.4	17.0	14.5	21.4

a. HH = Head of household

b. Farmer Nbr. 28's dramatic decrease in area planted is probably due to her husbands death.

TABLE A6: CHANGES IN AREAS PLANTED BY HOUSEHOLD, COOPERATORS SURVEY, FRANCISTOWN AREA, 1983-87

FARMER NO.	83-4/84-5 CHANGE FROM	83-4/84-5 PERCENT CHANGE	84-5/85-6 CHANGE FROM	84-5/85-6 PERCENT CHANGE	85-6/86-7 CHANGE FROM	85-6/86-7 PERCENT CHANGE	83-4/86-87 CHANGE FROM	83-4/86-87 PERCENT CHANGE
Matobo								
1	.9	50.0	-.3	-11.1	-.3	-12.5	.3	16.7
2	2.6	86.7	-.1	-1.8	.2	3.6	2.7	90.0
3	2.4	150.0	-2.4	-60.0	.2	12.5	.2	12.5
4	1.6	38.1	0	0	.1	1.7	1.7	40.5
5	-.5	-10.6	-.9	-21.4	1.3	39.4	-.1	-2.1
6	7.6	292.3	-1.1	-10.8	-5.8	-63.7	.7	26.9
7	.3	14.3	.7	29.2	-1.7	-54.8	-.7	-33.3
8	.1	8.3	-.1	-7.7	1.1	52.4	1.1	91.7
9	-.7	-17.1	-.4	-11.8	.4	13.3	-.7	-17.1
10	1.6	84.2	-.2	-5.7	-.2	-6.1	1.2	63.2
Mathangwane								
11	1.5	136.4	-.5	-19.2	.4	19.0	1.4	127.3
12	1.9	0	-1.9	-100.0	0	0	0	0
13	1.9	111.8	1.7	47.2	1.4	26.4	1.9	111.8
14	5.1	92.7	-.8	-7.5	4.1	41.8	7.0	127.3
15	.2	12.5	0	0	.4	22.2	.6	37.5
16	3.7	284.6	1.1	22.0	-3.0	-49.0	1.8	138.5
17	14.3	128.6	-10.2	-40.2	-8.0	-52.6	-3.9	-35.1
18	2.2	244.4	1.3	41.9	-2.1	-47.7	1.4	155.6
19	0	0	.5	0	.4	80.0	.8	0
20	5.3	93.0	-1.5	-13.6	8.7	86.3	12.0	210.5
Marapong								
21	.7	8.5	-.6	-6.7	-5.3	-65.1	-5.3	-64.6
22	1.4	20.6	.1	1.2	-5.7	-68.7	-4.2	-61.8
23	.7	7.1	-1.6	-15.1	4.0	444.4	-5.0	-50.5
24	1.2	15.6	-.5	-5.6	-5.7	-67.9	-5.0	-64.6
25	-1.0	-43.5	-.5	-38.5	1.9	237.5	.4	17.4
26	.5	22.5	1.3	26.5	-.5	-8.1	1.7	42.5
27	5.1	68.9	-3.1	-24.8	-4.1	-43.6	-2.1	-28.4
28	3.1	10.2	-14.7	-43.5	10.2	54.2	-1.4	-4.6
29	.5	7.4	4.1	56.2	-1.5	-13.2	3.1	45.6
Overall Average	2.2	45.8	-1.1	-15.7	-.3	20.1	.4	34.2
Matobo	1.6	59.3	-.5	-11.0	-.4	-10.5	.7	25.9
Mathangwane	3.6	124.1	-1.0	-15.4	-.3	-5.4	2.3	70.3
Marapong	1.4	15.1	-1.7	-15.9	-.8	52.2	-2.0	-16.8
Male HH	2.0	34.5	-.9	-11.5	.2	10.2	1.1	50.6
Female HH	2.6	61.3	-1.4	-24.1	-1.5	-34.1	-.3	-9.4
0 Cattle	.9	61.8	.4	20.0	-.1	-4.2	1.2	109.1
1-15 Cattle	1.1	35.5	0	0	.5	20.8	-.2	-6.5
16-35 Cattle	2.9	50.9	-.4	-5.0	0	46.2	1.2	37.3
36-70 Cattle	2.0	48.7	-1.2	-18.5	-1.3	3.0	-.3	28.4
More than 70	8.7	41.8	-12.5	-42.5	-2.5	-14.7	-6.3	-30.3

HH = Head of household

TABLE A7: MOST PLANTED CROPS/*, COOPERATORS' SURVEY, FRANCISTOWN AREA, 1986-87

	TOTAL	VILLAGE: MATO	MATH	MARA	SEX OF HEAD OF HHD: MALE	FEMALE	CATTLE OWNERSHIP: 0	1-15	16-35	36-70	> 70
		PERCENT									
FIRST MOST PLANTED											
Sorghum	64	50	67	77	72	50	50	64	75	33	100
Millet	36	50	33	22	28	50	50	36	25	67	0
SECOND MOST PLANTED											
Sorghum	36	50	33	22	28	50	50	36	25	67	0
Millet	57	50	44	77	67	40	25	55	75	33	100
Maize	4	0	11	0	6	0	0	5	0	0	0
Cowpeas	4	0	11	0	0	10	25	0	0	0	0
THIRD MOST PLANTED											
Maize	50	50	44	56	55	40	75	30	62	67	50
Cowpeas	36	30	33	44	28	50	25	50	25	33	50
Millet	4	0	11	0	6	0	0	10	0	0	0
Groundnuts	4	10	0	0	0	10	0	0	12	0	0
Melons	4	10	0	0	6	0	0	10	0	0	0
FOURTH MOST PLANTED											
Millet	4	0	11	0	0	10	25	0	0	0	0
Maize	14	10	22	11	18	10	25	10	12	33	0
Cowpeas	36	30	44	33	41	30	50	30	38	33	50
Groundnuts	16	20	0	33	24	10	0	20	38	0	0
Jugobeans	7	10	0	11	0	20	0	10	12	0	0
Melons	14	20	11	11	18	10	0	20	0	33	50
Sweetseed	4	10	0	0	0	10	0	10	0	0	0

* MOST PLANTED refers to the crop that took up the most hectarage.

TABLE A8: HARVEST OF THE FOUR MOST PLANTED CROPS, SORGHUM, MILLET, MAIZE, AND COWPEAS, BY HOUSEHOLD, COOPERATOR'S SURVEY, FRANCISTOWN AREA, 1983-87 [KG/Household]

FARMER NO	SORG 1986-7	AVGSOR 1983-7	MILL 1986-7	AVGMIL 1983-7	MAIZ 1986-7	AVGMAI 1983-7	COWP 1986-7	AVGCOW 1983-7
Matobo								
1	18	50	10	12	NA	0	0	0
2	0	142	0	129	0	6	NA	2
3	0	52	0	19	NA	0	0	0
4	0	216	0	42	0	0	0	3
5	2	229	5	144	NA	4	0	15
6	12	558	25	579	NA	1	NA	0
7	0	138	0	25	0	0	NA	3
8	0	49	0	25	0	1	NA	0
9	2	117	0	151	0	36	0	1
10	70	185	5	46	0	3	0	0
Mathangeene								
11	12	28	0	0	0	0	1	1
12	NA	NA	NA	NA	NA	NA	NA	NA
13	9	108	9	32	0	0	3	2
14	12	623	6	101	14	6	6	12
15	0	9	3	10	0	0	1	1
16	12	163	0	12	0	122	12	6
17	70	1562	3	1	NA	23	0	152
18	12	323	1	42	NA	0	NA	0
19	0	0	0	0	0	0	0	0
20	12	220	140	315	0	6	0	8
Marapong								
21	10	248	70	236	0	24	0	57
22	62	111	25	36	NA	0	12	6
23	50	360	210	354	NA	13	25	15
24	0	368	50	118	0	40	0	55
25	20	185	70	152	NA	41	0	16
26	25	100	50	71	10	36	0	12
27	25	486	630	534	NA	23	0	0
28	30	2360	12	1051	30	52	0	53
29	25	406	280	326	12	26	25	56
OVERALL AVG.	18	336	57	163	1	1	3	17
VILLAGE:								
Matobo	10	174	4	117	0	5	0	3
Mathangeene	15	337	18	57	0	17	2	23
Marapong	27	514	155	320	10	28	7	30
SEX OF HH:								
Male HH	15	371	79	187	4	18	5	16
Female HH	23	302	30	113	2	15	2	21
CATTLE OWNERSHIP:								
0 Cattle	5	36	3	10	0	0	1	1
1-15 Cattle	14	161	19	60	0	22	3	11
16-35 Cattle	15	347	91	189	4	10	8	19
36-70 Cattle	32	263	212	244	0	42	0	0
> 70 Cattle	50	1961	8	526	30	38	0	102

HH = Head of Household SORG = Sorghum MILL = Millet MAIZ = Maize
COWP = Cowpeas NA = Not planted

TABLE A9: PARTICIPATION IN GOVERNMENT AGRICULTURAL PROGRAMMES, ARAP AND DROUGHT RELIEF ASSESSMENT SURVEY, FRANCISTOWN COOPERATOR FARMERS, 1986-87

		VILLAGE:			SEX OF HEAD OF HHD:		CATTLE OWNERSHIP:				
	TOTAL	MATO	MATH	MURA	MALE	FEMALE	0	1-15	16-35	36-70	> 70
ARAP:											
Ploughing	97	100	90	100	100	91	100	100	89	100	100
Seed	54	12	60	78	47	64	100	31	44	67	50
Fertilizer	11	0	10	22	18	0	0	8	11	33	0
Row Planting	11	0	0	33	18	0	0	0	22	33	0
Weeding	68	100	40	67	76	55	25	54	78	100	50
Fencing	0	0	0	0	0	0	0	0	0	0	0
Destumping	29	0	30	58	35	18	0	15	44	33	50
DROUGHT RELIEF:											
Ploughing	29	11	70	0	29	27	25	23	33	0	50
Seed	75	89	100	33	78	73	100	54	78	67	50
Row Planting	0	0	0	0	0	0	0	0	0	0	0
Destumping	11	33	0	0	12	9	0	8	22	0	0
Fodder	0	0	0	0	0	0	0	0	0	0	0
ALDEP:											
Fencing	14	11	10	22	12	18	25	15	11	0	0
Donkeys	4	0	10	0	0	9	25	0	0	0	0
Oxen	4	0	10	0	0	9	0	0	0	0	50
Plough	61	58	60	67	65	55	75	23	89	33	100
Planter	7	0	0	22	12	0	0	0	22	0	0
Sebele Planter	7	0	20	0	6	9	0	0	22	0	0
Cultivator	14	0	20	22	18	13	0	0	44	0	0
Harrow	7	0	10	11	12	0	0	0	22	0	0
Labour Based Drought Relief Projects	68	100	60	44	65	73	100	46	56	100	50
School Feeding	71	77	50	44	59	82	100	46	67	67	100
Child Rations	61	77	100	22	53	73	75	39	78	67	0