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AGRICULTURAL TECHNOLOGY IMPROVEMENT PROJECT (ATIP)

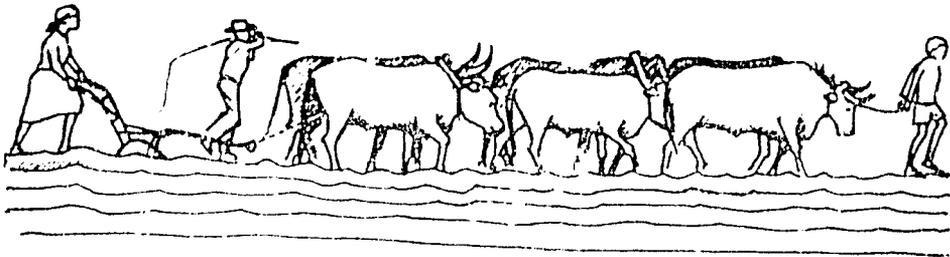
BEAN BASELINE SURVEY

BY

M. MANTHE, D. NORMAN, F. WORMAN AND L. MODIDI

ATIP WORKING PAPER

ATIP WP-24



Agricultural Technology Improvement Project
Department of Agricultural Research
Ministry of Agriculture
P/Bag 0033
Gaborone
Botswana

Telephone 352381 Ext. 260
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DEPARTMENT OF AGRIC. RESEARCH
MINISTRY OF AGRICULTURE
BOTSWANA

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ADDRESSES:

P/BAG 0033
GABORONE

P.O. BOX 10
MAHALAPYE

P.O. BOX 10275
TATITOWN (FRANCISTOWN)

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BEAN BASELINE SURVEY

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BEAN BASELINE SURVEY

BACKGROUND

In early 1989, the cowpea agronomist in the Department of Agricultural Research (Ms. M. Manthe) was approached by the Regional SADCC Bean/Cowpea programme concerning the popularity of beans in Botswana. Previous studies have indicated that beans are rarely grown under the low rainfall conditions of Botswana. However, it was decided that a verification survey, consisting of a single interview with a sample of farmers should be undertaken.

APPROACH

Samples of farming households were selected in three areas where farming systems research teams are located. These were two areas where the Agricultural Technology Improvement Project (ATIP) has teams, i.e., Mahalapye and Francistown, and in the area around Kanye, where the Farming Systems Southern Region (FSSR) team is located. The selected households were administered a questionnaire which was based on an earlier cowpea survey (Baker, 1984; Miller and Seleka, 1985).¹

The samples were selected randomly in the villages. The sampling frames used in the different villages differed according to the most complete lists of households available. Details are as follows:

- (a). In the three ATIP Francistown villages of Mathangwane, Matobo and Marapong the sampling frame used was that derived from the census undertaken by ATIP in 1983 (Miller, 1985).
- (b). In the Mahalapye area, the sampling frames used in the ATIP villages of Makwate and Snoshong were those derived from the census (unpublished) and crop management surveys (Baker, 1984) undertaken in the early years of the ATIP project. Unfortunately, no equivalent sampling frame exists in Makoro where work started later. Therefore, the sample drawn was based on those who were involved in the drought relief survey undertaken more recently.²

The survey administered covered a number of topics including:

- Household information
- Bean cultivation practices
- Husbandry problems of growing beans
- Production, utilization and marketing of beans
- Farmer desire for beans.

¹ The questionnaire used in the Bean Baseline Survey is in the appendix to this paper.

² To date, the material from this survey is unpublished, although an executive summary has been produced (ATIP, ADNP and FSSR, 1988).

Four types of beans were covered in the survey, namely:

Common or haricot bean (*Phaseolus vulgaris*)

Tepary bean (*Phaseolus acutifolius*)

Lima bean (*Phaseolus lunatus*)

Runner bean (*Phaseolus coccinea*).

Because beans are rarely grown by farmers in Botswana, there was concern that there could be confusion over the identification of the different types of beans, as well as the correct identification of the different diseases and insects. In an effort to minimize confusion, Ms. M. Manthe visited each of the areas to instruct the enumerators about the survey and left, with them, samples of the different bean varieties together with pictures of the different diseases and insects affecting beans. These were shown to the respondents when they were being interviewed by the enumerators.

Once the data were collected, they were entered into dBase III Plus and transferred into ABSTAT where most of the analysis was undertaken.

PROBLEMS OF THE SURVEY

In spite of the efforts described above, the results of the survey still indicated some confusion about the differences between beans, cowpeas and juko beans (bambara nuts). Consequently questionnaires from villages in the Southern Region had to be excluded from the analysis because of the obvious confusion over differentiating between the various species.

WHO GROWS BEANS?

Out of the total sample size of 144 households, only 10.4% grew beans in 1988, and only 11.1% in 1989. In fact, as Table 1 indicates, a total of 77% of the farmers did not grow any beans during the last five years -- 1984/1985 season through 1988/1989 season. Of the 33 farmers (22.9%) who did grow beans during the last five years, only seven grew them in both 1988 and 1989. Thus beans are not a popular crop in the arable activities of farmers in Botswana. This verifies earlier, more general surveys, that have been conducted.

TABLE 1: FREQUENCY OF GROWING BEANS DURING THE LAST FIVE YEARS^a

NUMBER OF YEARS	NUMBER OF FARMERS	PERCENTAGE OF FARMERS
0	111	77.1
1	19	13.2
2	7	4.9
3	3	2.1
4	1	0.7
5	3	2.1

a. Only seven farmers grew beans in both 1988 and 1989.

The breakdown of the sample according to village is given in Table 2. Some differences did exist in terms of the percentage of households growing beans in each of the villages. In general, the figures appear to indicate that growing beans was less popular in the Francistown villages than in the Mahalapye villages.

Farmers were questioned as to why they did not grow beans during the 1987/1988 and 1988/1989 seasons. Table 3 indicates the reasons. By far, the most important reason given was that farmers did not possess seed. The lack of seed can partially be attributed to the fact that these seeds are not distributed through the Seed Multiplication Unit and the Department of Agricultural Field Services, and that beans are not traditionally grown by farmers.

TABLE 2: HOUSEHOLDS GROWING BEANS, BY VILLAGE, SOMETIME DURING THE LAST FIVE YEARS

AREA	VILLAGE	NUMBER OF FARMERS IN SAMPLE	GROWING BEANS	PERCENT OF FARMERS GROWING BEANS
MAHLAAPYI	MAKORO	16	0	0.0
	MAKWATE	20	15	75.0
	SHOSHONG	19	9	47.4
FRANCISTOWN	MARAPONG	30	2	6.7
	MATLANGWANE	30	2	5.1
	MATOBO	20	5	25.0
OVERALL		144	33	22.9

TABLE 3. REASONS FOR NOT GROWING BEANS IN 1988 AND 1989

REASON	1987/88		1988/89	
	NUMBER OF FARMERS	PERCENT OF REASONS	NUMBER OF FARMERS	PERCENT OF REASONS
LACK OF SEEDS	110	86.6	108	84.4
LACK OF RAINFALL	4	3.1	7	5.5
LACK OF DRAUGHT POWER	2	1.6	3	2.3
LACK OF LABOUR	2	1.6	1	0.8
OTHER	0	7.1	9	7.1
TOTAL	127		128	

a. In both 1988 and 1989 one farmer gave no reason for not growing beans. Only 16 farmers grew beans in 1988, and 15 farmers grew beans in 1989.

Little difference appeared to exist between the type of households who grew beans and those that did not (Table 4).

TABLE 4 SIZE AND STRUCTURE OF HOUSEHOLDS

VARIABLE	HOUSEHOLDS GROWING BEANS	HOUSEHOLDS NOT GROWING BEANS
NUMBER OF HOUSEHOLDS	53	111
COMPOSITION OF HOUSEHOLD		
MORE THAN 15 YEARS OLD		
MALE	1.9	1.8
FEMALE	1.9	1.6
SCHOOL AGE CHILDREN	1.6	1.8
PRE SCHOOL AGE CHILDREN	1.4	1.5
TOTAL	6.8	6.7
HOUSEHOLD HEAD		
AVERAGE AGE	56.2	56.4
PERCENT FEMALE HEADED	39.4	30.6
CATTLE OWNERSHIP (PERCENT HOUSEHOLDS)		
OWN NO CATTLE	27.3	22.5
OWN 1-15 CATTLE	38.5	54.1
OWN MORE THAN 15 CATTLE	21.2	23.4

From Table 4, it appears that:

- (a). There were no significant differences in the size and composition of the households.
- (b). There was no significant difference in the average age of the households heads. In general, the average age of both groups of households was 56 years old.
- (c). Approximately the same proportion of female-headed households did, or did not, grow beans during the last five years (i.e., 39% and 31% of the households respectively).
- (d). Wealth status -- which was measured indirectly by the numbers of cattle owned by the household -- did not appear to influence whether beans were grown or not. Twenty-seven percent of the farming households growing beans did not own cattle compared with 22 percent of the households who did not grow beans.

The following analysis is based on the sub-sample of farmers who actually grew beans during the last five years. This consisted of 33 out of the 144 farmers.

TYPES OF BEANS GROWN

Table 5 lists the types of beans grown, together with the source of the seed and how much seed was used. In general, the results indicate that little emphasis was given to growing beans in the villages surveyed. Tepary was the most popular bean grown followed by runner beans. No lima beans were grown in the villages.

TABLE 5 TYPES OF BEANS GROWN, SOURCE AND AMOUNT OF SEED USED AND PRODUCTION LEVELS^a

NUMBER GROWING BEANS	COMMON BEAN	TEPARY BEAN	RUNNER BEAN	TOTAL ^b
	6	16	13	36
SOURCE OF SEED (PERCENT):				
OWN	0.0	18.7	15.4	16.7
GOVERNMENT	16.7	6.3	7.7	8.3
FARMERS	66.7	56.0	30.8	44.4
STORE	16.6	25.0	46.1	30.6
AVERAGE AMOUNT OF SEED USED (PERCENT):				
< 5 KGS	100.0	56.2	76.9	72.2
5-10 KGS	--	25.0	15.4	16.7
> 10 KGS	--	18.8	7.7	11.1
AVERAGE PRODUCTION OF BEANS:				
% OF PLOTS - 0 KGS	50.0	25.0	30.8	30.5
PRODN INCLUDING 0 YIELDS	6	41	20	28
PRODN EXCLUDING 0 YIELDS	9	54	30	41

a. No farmer in the sample grew lima beans.

b. Includes information for one plot where the type of bean was not known. Three farmers grew more than one type of bean.

c. This seed was handed out to children at school, and not through official government channels.

The most popular source of seed was from other farmers, followed by purchases from stores. In some cases, small quantities of seed were brought home from school by the children. The amount of seed used was minimal and, in general, involved less than five kilograms. Bearing in mind that cowpeas require at least 20 kilograms per hectare to plant, this would imply that the average area of beans planted per household amounted to less than 0.25 of a hectare.

Forty-five percent of the farmers planted beans as a sole crop. Since most crops are planted in mixtures, this implies that farmers recognise that beans are better grown in sole stands and/or recognise the shortage of bean seed. Consequently, they prefer to maximise the return from the limited bean seed.

DRAUGHT AND LABOUR

Table 6 indicates that over 54% of the farming households growing beans sometime during the last five years, had control over the draught -- mainly donkeys -- while 45% of the farmers hired draught, mainly in the form of tractors. This is not unexpected, bearing in mind the impact of the ARAP programme which has encouraged the use of hired traction.

TABLE 6. DRAUGHT USED ON LAND WHERE BEANS WERE PLANTED

VARIABLE	CONTROL DRAUGHT	DRAUGHT DEPENDENT	TOTAL
NUMBER OF HOUSEHOLDS	18	15	33
TYPE OF DRAUGHT (PERCENT)			
TRACTOR	5.6	80.0	39.4
OXEN	38.9	13.3	27.3
DONKEYS	50.0	6.7	30.3
HAND HOE	5.5		3.0

Eighty-five percent of the fields containing beans were broadcast rather than row planted.¹ This is a somewhat higher figure than would perhaps be expected, given that 45% of the bean crop was sole planted. Only one farmer (3%) did not weed while of those who weeded, 75% weeded only once.

Table 7 indicates who, during the last year that the crop was cultivated, was responsible for the various labour operations involved in growing beans. As other studies have indicated, ploughing is still usually undertaken by men -- often not a member of the household because of the importance of hired traction -- while weeding and harvesting are still primarily undertaken by household female labour.

TABLE 7. TYPE OF LABOUR USED IN DIFFERENT BEAN OPERATIONS

OPERATION	PERCENT HOUSEHOLD		PERCENT NON HOUSEHOLD		PERCENT MIXED	TOTAL # OBSERVATIONS*
	MALE	FEMALE	MALE	FEMALE		
PLOUGHING	18.2	48.2	39.4	48.2	9.0	33
PLANTING	9.2	24.2	33.3		34.3	33
WEEDING	6.4	33.9		3.2	6.5	31
HARVESTING	8.7	7.3			13.0	23

* These represent the number of households from which the information was drawn. In the case of weeding one household did not weed and another one did not respond to the question about who weeded. With reference to harvesting the number of observations are lower because 10 households harvested no beans.

Farmers were asked whether they experienced labour shortages with respect to the various operations involved in growing beans. Seventy percent indicated that labour was not a problem. For those who did face a labour shortage, harvesting followed by weeding, were the major labour constraints. As will be discussed later, harvesting is perceived as a problem, where it has to be undertaken early to avoid shattering of the pods, particularly with reference to tepary beans.

¹ Two farmers in fact planted beans with the help of a hand hoe.

HUSBANDRY PROBLEMS

The figures in Table 8 indicate that of those farming families who have grown beans, at least once during the last five years, only 24% had no problems growing them. The other farmers indicated that insects and pests were a major problem. Additionally, these farmers experienced problems in establishing a good stand, often due to the hot, dry weather.

TABLE 8 MAJOR HUSBANDRY PROBLEMS IN GROWING BEANS

VARIABLE	HOUSEHOLDS	
	NUMBER	PERCENTAGE
NONE	8	24.2
DIFFICULT TO ESTABLISH A GOOD STAND	6	18.2
FLOWER ABORTION DUE TO INSECT PESTS	6	18.2
INSECT PESTS DESTROY PODS	6	18.2
DAMAGE BY HARMS, ANTS, ETC	4	12.1
OTHERS	3	9.1

Of those who responded to the specific questions about insect damage, 43% of the farmers sighted insect pests in the field, at some time (Table 9). Also 11.5% had noticed problems with insects pests in storage. However, the latter figure is probably grossly under estimated, since it would be a lot higher if more farmers had harvested beans and had produced a greater quantity of beans, which would have encouraged them to store the crop.

TABLE 9 INSECT PROBLEMS ON BEANS IDENTIFIED BY FARMERS

INSECT PROBLEM IDENTIFIED IN THE FIELD	NUMBER OF RESPONSES	PERCENT
NUMBER OF RESPONSES	30	
% WHO IDENTIFIED A PROBLEM	13	43.3
BREAKDOWN OF SPECIFIC INSECTS:		
FLOWER THRIPS	4	30.8
APHIDS	3	23.1
LEAFHOPPERS	2	15.4
RED AND BLACK BUG	2	15.4
OTHERS	2	15.3
IDENTIFIED IN STORAGE:		
NUMBER OF RESPONSES	26	
% WHO IDENTIFIED A PROBLEM	3	11.5
% DUE TO BEAN STORAGE WEEVIL	3	100.0

Table 9 indicates the types of insects that were present. Flower thrips and aphids were recognised as being major problems, as were weevils in the stored beans. In general, people who recognised these problems, did little about them. Some attempts were made to control storage pests through wood ash and putting the beans in the sun to dry -- thus killing the insects. However, no one had ever sprayed growing beans.

In Table 10, the results indicate that only 35% of the farmers had recognised disease problems in the field. The major problem identified was the BCMV virus and fusarium species of various sorts. Nothing had ever been done to control the diseases identified. CAMV virus is recognised as being a major problem on cowpeas, and consequently the presence of an analogous virus on beans is not altogether surprising.

TABLE 10: BEAN DISEASE PROBLEMS IDENTIFIED BY FARMERS

DISEASE VARIABLE	NUMBER OF RESPONSES	PERCENT
NUMBER OF RESPONSES	20	
PERCENT WHO IDENTIFIED A PROBLEM	7	35.0
PERCENT BREAKDOWN BY DISEASE		
BCMV	3	42.8
FUSARIUM SP.	2	28.6
BEAN COMMON BLIGHT	1	14.3
WEB BLIGHT	1	14.3

PRODUCTION AND CONSUMPTION

As noted in Table 5, the production of all types of beans was very low with a high proportion of plots giving no yield at all. The production of tepary beans was the highest followed by runner beans. The average production of beans of various types, per household, was 28.3 kgs. Excluding those who tried to grow them, but harvested nothing, the average production was 41 kilograms per household.

In terms of disposing of the beans produced, Table 11 indicates that most of them were eaten, and only four (17%) households sold any production at all. All four households sold their beans to other farmers.

TABLE 11 DISPOSAL OF BEANS PRODUCED

DISPOSITION	NUMBER OF RESPONSES	PERCENT
EAT	17	73.9
EAT AND SOLD	3	13.0
SAVE FOR SEED	2	8.7
SOLD	1	4.3

Table 12 indicates that families producing beans were more likely to eat them, and likely to eat them more frequently, than those households not producing beans. It also notes that a major source of beans for those eating them, in the case of families producing beans, was from home production. Those families not producing beans, most frequently purchased from local traders or stores. Finally, Table 12 indicates that, in general, the current consumption of beans by farming households is very low, and in fact, the potential demand for beans for consumption purposes also appears to be very low. Not surprisingly perhaps, the families producing beans would like to eat more and eat them more frequently than households that do not produce beans.

TABLE 12: ACTUAL AND DESIRED CONSUMPTION OF BEANS BY THE HOUSEHOLD IN ONE YEAR STARTING JUNE 1988

CONSUMPTION VARIABLE	HOUSEHOLDS PRODUCING BEANS		HOUSEHOLDS NOT PRODUCING BEANS	
	NUMBER	PERCENT	NUMBER	PERCENT
FREQUENCY OF BEAN CONSUMPTION BY HOUSEHOLD				
NUMBER OF RESPONSES	30		111	
DON'T EAT BEANS	3	10.0	49	44.2
LESS THAN ONCE PER WEEK	3	10.0	15	13.5
ONCE PER WEEK	11	36.7	32	28.8
TWO TO THREE TIMES PER WEEK	13	43.3	15	13.5
SOURCE OF BEANS CONSUMED BY THE HOUSEHOLD				
NUMBER OF RESPONSES	27		62	
LOCAL TRADER (SHOP)	2	7.5	39	62.9
OTHER FARMERS	4	14.8	16	25.8
HOUSEHOLD PRODUCTION	14	51.8	-	-
OTHER OR MIXTURE OF ABOVE	7	25.9	7	11.3
CONSUMPTION (KGS/HOUSEHOLD)				
ACTUAL:				
NUMBER OF RESPONSES	30		105	
KGS/HOUSEHOLD				
LOW	0.0		0.0	
HIGH	100.0		140.0	
AVERAGE	26.8		14.3	
MEDIAN	24.5		0.0	
DESIRED:				
NUMBER OF RESPONSES	30		80	
KGS/HOUSEHOLD				
LOW	0.0		0.0	
HIGH	490.0		700.0	
AVERAGE	67.4		61.6	
MEDIAN	50.0		0.0	

THE FUTURE FOR BEANS

In spite of somewhat low estimates of current consumption and desired consumption of beans by households, an overwhelming number would like to grow more beans or to start growing beans (Table 13).

TABLE 13: DESIRE TO GROW MORE BEANS

VARIABLE	HOUSEHOLDS PRODUCING BEANS		HOUSEHOLDS NOT PRODUCING BEANS	
	NUMBER	PERCENT	NUMBER	PERCENT
WANT TO GROW MORE BEANS?				
NUMBER OF RESPONSES	33		107	
YES	29	87.9	101	94.4
NO	4	12.1	6	5.6
IF YES, WHY HAVEN'T THEY?				
NUMBER OF RESPONSES	29		91	
LACK OF SEED	19	65.5	82	90.1
LACK OF LABOUR	4	13.8	2	2.2
INSUFFICIENT RAINFALL	4	13.8	1	1.1
OTHER OR MIXTURE	2	6.9	6	6.6
WOULD PREFER TO GROW?				
NUMBER OF RESPONSES	29		100	
ONE SPECIES	3	10.3	20	20.0
SEVERAL SPECIES	26	89.7	80	80.0
IF GROW SEVERAL SPECIES, WHY?				
NUMBER OF RESPONSES	26		79	
DIFFERENT USES FOR SPECIES	22	84.8	72	91.1
DIFFERENT LENGTHS GROWING TIMES	2	7.7	5	6.3
OTHER	2	7.7	2	2.5

In Table 13, a lack of seed was the major reason given for not growing beans, although not surprisingly, this reason was more relevant to those who were not currently growing them. The table also notes that farmers would prefer to grow several species of beans, mainly because different species are grown for different purposes, for example, selling, eating, etc. However, there is no evidence from the findings presented earlier in this report that the current levels of production of different types of beans, result in different uses. Finally, Table 13 indicates the major likes and dislikes given by farmers with reference to the different species of beans that are grown. Good prices are mentioned as a major reason for growing beans, although to date, little production appears to be sold. In terms of dislikes, labour requirements are mentioned as a major problem, although this is sometimes expressed as requiring labour at inconvenient times. For example, in the case of tepary beans, early harvesting is important to avoid shattering of the pods.

CONCLUDING COMMENT

In conclusion, it is apparent that beans are not currently an important crop in the survey areas. Although, strictly speaking, the survey is not nationally representative, it is apparent in travelling around, that beans are not commonly grown in Botswana at the present time. The levels of production are low and consumption by farming households -- both currently and potentially -- also appears to be low. However, farmers do seem to be willing to grow beans if seed were available. However, this conclusion should be interpreted carefully because husbandry problems such as establishing a good stand, may with more experience on the part of farmers, discourage them from expanding production of this crop to a greater extent.

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APPENDIX: THE BEAN BASELINE SURVEY FORM

DEPARTMENT OF AGRICULTURAL RESEARCH

1989 BEAN BASELINE SURVEY

NAME OF RESPONDENT _____ ID _____ IDNO _____
DISTRICT: _____ VILL _____
VILLAGE: _____ DIST _____
ENUMERATOR: _____ DWELLING UNIT NO. _____ DVDU _____

NOTE TO CODERS: If there is more than one response to any question code them from lowest value to the highest, e.g., 1358 not 3158.

PART ONE: HOUSEHOLD INFORMATION

1. HEAD OF HOUSEHOLD:

A. NAME: _____
B. SEX: (1) MALE _____ (2) FEMALE _____ SEX _____
C. YEAR BORN: _____ AGE _____

2. SIZE OF HOUSEHOLD:

A. NUMBER MALES BORN BEFORE 1971: _____ MHM _____
B. NUMBER FEMALES BORN BEFORE 1971: _____ FHM _____
C. NUMBER SCHOOL AGE CHILDREN BORN SINCE 1971: _____ CHM _____
D. NUMBER PRE-SCHOOL AGE CHILDREN: _____ BHM _____

3. PLEASE INDICATE THE NUMBER OF CATTLE OWNED:

(0) NO CATTLE _____ (1) 1-15 CATTLE _____ (2) 16-35 CATTLE _____ CAT _____
(3) 36-70 CATTLE _____ (4) >70 CATTLE _____

PART TWO: BEAN CULTIVATION PRACTICES

4. DID YOU PLANT BEANS THIS SEASON (1988/89)? (1) YES: _____ (2) NO: _____ GB89 _____
A. IF NO, WHY NOT? (1) LACK OF DRAUGHT POWER _____ NB89 _____
(2) LACK OF RAINFALL _____
(3) LACK OF LABOUR _____
(4) LACK OF SEEDS _____
(5) OTHER: _____

5. DID YOU PLANT BEANS LAST YEAR (1987/1988)? (1) YES: ___ (2) NO: ___ GB88 ___

- A. IF NO, WHY NOT? (1) LACK OF DRAUGHT POWER ___ NB88 ___
 (2) LACK OF RAINFALL ___
 (3) LACK OF LABOUR ___
 (4) LACK OF SEEDS ___
 (5) OTHER: _____

6. DURING THE PAST FIVE YEARS (INCLUDING THIS YEAR), HOW MANY YEARS HAVE YOU GROWN BEANS? (CIRCLE THE CORRECT NUMBER OF YEARS.) GBYR ___

1 2 3 4 5

(NOTE: IF THE FARMER HAS NOT GROWN BEANS DURING THE PAST FIVE YEARS, GO TO QUESTION NO. 21. IF THE FARMER HAS GROWN BEANS DURING THE PAST FIVE YEARS, ANSWER THE FOLLOWING QUESTIONS FOR THE MOST RECENT YEAR HE OR SHE GREW BEANS.)

7. WHICH YEAR IS BEING TALKED ABOUT? (PLEASE CIRCLE) YEAR ___

1988/89 1987/88 1986/87 1985/86 1984/85

8. WHAT TYPE(S) OF DRAUGHT POWER WAS USED FOR PLOUGHING THE LANDS WHERE BEANS WERE PLANTED? (CHECK ALL THAT APPLY) DRFT ___

- (1) DONKEYS: ___ (2) CATTLE: ___ (3) TRACTOR: ___ (4) HAND HOE: ___

A. WAS THE ABOVE TRACTION: DRAC ___

- (1) OWNED OR CO-OWNED: ___ (2) BORROWED OR MAFISAD: ___
 (3) HIRED: ___ (4) OBTAINED THROUGH COOPERATIVE AGREEMENT: ___

9. WHAT SOIL TILLAGE WAS DONE FOR BEANS IN ADDITION TO PLOUGHING? TILL ___

- (1) HARROWING: ___ (2) CULTIVATING: ___ (3) NONE: ___
 (4) OTHER (SPECIFY): _____

10. WHAT SPECIES OF BEANS WERE PLANTED? FOR EACH SPECIES, WHAT WAS THE PRIMARY SOURCE OF SEED AND APPROXIMATELY HOW MUCH SEED WAS PLANTED? (SHOW SAMPLES OF DIFFERENT TYPES)

	YES: ___ NO: ___	SOURCE				KGS			CBSC ___ CBKG ___
		OWN (1)	GOVT (2)	FARMER SHOP (3)	SHOP (4)	<5 (1)	5-10 (2)	>10 (3)	
COMMON BEAN (PHASEOLUS VULGARIS) OR HARICOT BEAN	YES: ___ NO: ___	___	___	___	___	___	___	___	CBSC ___ CBKG ___
TEPARY BEAN (PHASEOLUS ACUTIFOLIS) OR DIBONKISI	YES: ___ NO: ___	___	___	___	___	___	___	___	TBSC ___ TBKG ___
LIMA BEAN (PHASEOLUS LURATUS)	YES: ___ NO: ___	___	___	___	___	___	___	___	LBSC ___ LBKG ___
PUNNEP BEAN (PHASEOLUS COCCINEA)	YES: ___ NO: ___	___	___	___	___	___	___	___	PBSC ___ PBKG ___
OTHER (SPECIFY) _____	YES: ___ NO: ___	___	___	___	___	___	___	___	OBSC ___ OBKG ___
DON'T KNOW SPECIES	YES: ___ NO: ___	___	___	___	___	___	___	___	DKSC ___ DKKG ___

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11. DID YOU PLANT BEANS AS A SOLE CROP OR TOGETHER WITH OTHER CROPS? SOLE _____
 (1) SOLE CROP: _____ (2) WITH OTHER CROPS: _____ (3) BOTH WAYS: _____

12. WHAT METHOD(S) OF PLANTING BEANS DID YOU USE? (CHECK ALL THAT APPLY) PLMD _____
 (1) BROADCAST: _____ (2) ROW PLANTER: _____ (3) HAND HOE PLANT: _____
 (4) HARROW PLANT: _____ (5) OTHER (SPECIFY) : _____

13. ON THE LAND YOU PLANTED IN BEANS, WHO PROVIDED LABOUR FOR THE FOLLOWING OPERATIONS? WAS IT HOUSEHOLD OR NON-HOUSEHOLD MEMBERS? MEN OR WOMEN?

	HOUSEHOLD		NON-HOUSEHOLD		
	MALE(1)	FEMALE(2)	MALE(3)	FEMALE(4)	
PLOUGHING	_____	_____	_____	_____	PGLA _____
PLANTING	_____	_____	_____	_____	PTLA _____
HARROWING	_____	_____	_____	_____	HALA _____
WEEDING	_____	_____	_____	_____	WELA _____
HARVESTING	_____	_____	_____	_____	HVLA _____

A. WAS LABOUR ALWAYS AVAILABLE WHEN NEEDED? (1) YES: _____ (2) NO: _____ AVLA _____
 B. IF LABOUR WAS NOT ALWAYS AVAILABLE WHEN NEEDED, FOR WHAT OPERATIONS WAS THERE TOO LITTLE LABOUR? LASH _____
 (1) PLOUGH AND/OR PLANT: _____ (2) WEED: _____ (3) HARVEST: _____

14. DID YOU WEED YOUR BEANS? (1) YES: _____ (2) NO: _____ WEED _____
 A. IF YES, HOW MANY TIMES DID YOU WEED? TWED _____
 (1) ONE TIME: _____ (2) TWO TIMES: _____ (3) MORE THAN 2: _____

PART THREE: HUSBANDRY PROBLEMS

15. WHAT IS (ARE) THE MAJOR HUSBANDRY PROBLEM(S) IN GROWING BEANS? HPRB _____
 (1) DIFFICULT TO ESTABLISH GOOD STAND: _____
 (2) FLOWER ABORTION DUE TO INSECT PESTS: _____
 (3) INSECT PESTS DESTROY PODS: _____
 (4) FUNGUS OR OTHER DISEASE: _____
 (5) OTHER (SPECIFY): _____

16. HAVE INSECTS INFESTED YOUR BEANS AT SOME TIME?
 IN THE FIELD? (1) YES _____ (2) NO _____ INSEF _____
 IN STORAGE? (1) YES _____ (2) NO _____ INSES _____
 A. IF YES, WHICH ONES? (SHOW PICTURES) CINS _____
 (11) LEAFHOPPERS _____ (17) POD SUCKING BUG _____
 (12) FLOWER THRIPS _____ (18) TIP-WILTER _____
 (13) LESSER ARMY WORM _____ (19) SPINY BROWN BUG _____
 (14) APHIDS _____ (20) RED & BLACK BUG _____
 (15) BLISTER BEETLES _____ (21) BEAN STORAGE WEEVIL _____
 (16) FLOWER EATING BEETLE _____ (22) DON'T KNOW _____

B. IF YES, WHAT DO YOU DO WHEN YOUR BEANS ARE INFESTED WITH INSECTS? AINS_____

- (1) GENERALLY NOTHING: _____ (2) SPRAY INSECTICIDE _____
 (3) OTHER (SPECIFY): _____

17. WERE YOUR BEANS AFFECTED BY DISEASES? (1) YES _____ (2) NO _____ DISE _____

A. IF YES, WHICH DISEASES? (SHOW PICTURES) BDIS _____

- | | | |
|-------------------------------|-----------------------|-------|
| (11) MACROPHOMINA _____ | (16) _____ | _____ |
| (12) FUSARIUM SP. _____ | (17) _____ | _____ |
| (13) BEAN COMMON BLIGHT _____ | (18) _____ | _____ |
| (14) WEB BLIGHT _____ | (19) _____ | _____ |
| (15) BCMV _____ | (20) DON'T KNOW _____ | _____ |

B. IF YES, WHAT DO YOU DO WHEN YOUR BEANS HAVE DISEASES? ADIS _____

- (1) GENERALLY NOTHING: _____
 (2) PULL UP AND BURN DISEASED PLANTS: _____
 (3) TAKE SEED ONLY FROM HEALTHY PLANTS: _____
 (4) OTHER (SPECIFY): _____

18. HAVE YOU EVER SPRAYED YOUR BEANS FOR INSECTS OR DISEASES: TREB _____

- (1) YES: _____ (2) NO: _____

A. IF YES, WHAT (INSECTICIDE/PESTICIDE) WAS USED: CHEM _____

_____ DON'T KNOW _____

PART FOUR: BEAN PRODUCTION, UTILIZATION & MARKETING

19. ABOUT HOW MANY BAGS OF BEANS (GRAIN) DID YOU HARVEST THE LAST YEAR YOU HARVESTED BEANS FOR EACH OF THE FOLLOWING SPECIES?

SPECIES	YEAR	NO OF BAGS	SIZE OF BAG
COMMON BEAN			CBBG _____ CBSZ _____
TEFARY BEAN			TBBG _____ TBSZ _____
LIMA BEAN			LBBG _____ LBSZ _____
RUNNER BEAN			RBBG _____ RBSZ _____
OTHER _____			OBBG _____ OBSZ _____
DON'T KNOW			DKBG _____ DKSZ _____

B. WHAT DID YOU DO WITH THE BEANS YOU HARVESTED?
(CHECK ALL THAT APPLY)

MKTB_____

- (1) EATEN BY HOUSEHOLD _____ (4) SAVE FOR SEED _____
 (2) SOLD _____ (5) OTHER: _____
 (3) GIVEN AWAY _____

20. HAVE YOU EVER SOLD BEANS (GRAIN)? (1) YES:_____ (2) NO:_____

SLDB_____

A. IF YES, WHEN AND TO WHOM DID YOU SELL BEANS? (CHECK ALL THAT APPLY). WHAT PRICE DID YOU RECEIVE FOR THE BEANS? (INDICATE PRICE PER KG, PRICE PER BAG ETC. INCLUDE SIZE OF BAG.)

[Will code as price per kg]

TO WHOM	YES /NO	WHEN		PRICE		
		MONTH	YEAR	PULA	UNIT	
(1) ANOTHER HOUSEHOLD	_____	_____	_____	_____	_____	TMSB1 _____ TWSB1 _____ PRSB1 _____
(2) LOCAL TRADER	_____	_____	_____	_____	_____	TMSB2 _____ TWSB2 _____ PRSB2 _____
(3) BAMB	_____	_____	_____	_____	_____	TMSB3 _____ TWSB3 _____ TRSB3 _____
(4) WHOLESALER (SEFALANA)	_____	_____	_____	_____	_____	
(5) OTHER: _____	_____	_____	_____	_____	_____	

21. HOW OFTEN DO YOU EAT BEANS?

EATB_____

- (1) LESS THAN ONCE A WEEK _____
 (2) ONCE A WEEK _____
 (3) TWO OR MORE TIMES A WEEK _____
 (4) DO NOT EAT BEANS _____

22. FROM WHERE DO YOU GET BEANS FOR EATING? (CHECK ALL THAT APPLY)

WHOG_____

- (1) HOUSEHOLD PRODUCTION _____
 (2) OTHER FARMERS _____
 (3) LOCAL TRADER (SHOP) _____
 (4) WHOLESALER _____
 (5) OTHER: _____

23. HOW MANY BAGS OF BEANS HAVE YOU USED TO FEED ALL THE MEMBERS OF YOUR HOUSEHOLD SINCE JUNE 1988 (IN THE LAST YEAR)?

BGNOH_____

NUMBER OF BAGS: _____

A. WHAT IS THE SIZE OF THE BAG WEIGHT FOR THE ANSWER ABOVE?

BGKG_____

- (1) 50 KG _____ (2) 70 KG _____ (3) OTHER _____

B. HOW MANY BAGS WOULD YOU LIKE TO HAVE HAD?

NUMBER OF BAGS: _____ BGNOI_____

PART FIVE: FARMERS DESIRE FOR BEANS

24. WOULD YOU LIKE TO GROW MORE BEANS? (1) YES:___ (2) NO:___ GRMB___

A. IF YES, WHAT IS PREVENTING YOU FROM GROWING MORE BEANS? PGRB___

- (11) LACK OF SEED _____ (17) LACK OF LABOUR _____
- (12) FIELDS NOT DESTUMPED_____ (18) INSUFFICIENT RAINFALL _____
- (13) LACK OF LAND _____ (19) LACK OF FENCING _____
- (14) INSECT PROBLEMS _____ (20) DISEASE PROBLEMS _____
- (15) LACK OF MARKETS _____ (21) LACK OF DRAUGHT POWER _____
- (16) OTHER (SPECIFY): _____

25. WOULD YOU PREFER TO PLANT ONE SPECIES OR SEVERAL DIFFERENT SPECIES OF BEANS? MVAR___

(1) ONE SPECIES _____ (2) SEVERAL SPECIES _____

A. IF YOU PREFER TO PLANT SEVERAL SPECIES, WHY? WMVA___

- (1) DIFFERENT SPECIES FOR DIFFERENT USES (EAT, SELL) _____
- (2) REDUCE DISEASE AND INSECT PROBLEMS _____
- (3) DIFFERENT LENGTH GROWING TIME _____
- (4) DIFFERENT SPECIES GROW BETTER WITH DIFFERENT CROPS _____
- (5) OTHER (SPECIFY) _____

26. IF YOU HAVE EVER PLANTED THE FOLLOWING SPECIES OF BEANS, WHAT DID YOU LIKE MOST ABOUT THE SPECIES? WHAT DID YOU LIKE LEAST ABOUT THE SPECIES? SAMPLES WILL BE PROVIDED TO SHOW FARMERS [Note: Will be post coded]

A. COMMON BEAN

LIKE: _____ CBLK___

DISLIKE: _____ CBDL___

B. TEPARY BEAN

LIKE: _____ TBLK___

DISLIKE: _____ TBDL___

C. LIMA BEAN

LIKE: _____ LBLK___

DISLIKE: _____ LBDL___

D. RUNNER BEAN

LIKE: _____ RBLK___

DISLIKE: _____ RBDL___

E. OTHER

LIKE: _____ MBLK___

DISLIKE: _____ MBDL___