MSU International Development Working Papers

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by

Julie A. Howard, Valerie Kelly, Julie Stepanek, Eric W. Crawford, Mulat Demeke, and Mywish Maredia

MSU International Development Working Paper No. 76
1999

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MSU Agricultural Economics Web Site: http://www.aec.msu.edu/agecon/
MSU Food Security II Web Site: http://www.aec.msu.edu/agecon/fs2/index.htm

GREEN REVOLUTION TECHNOLOGY TAKES ROOT IN AFRICA

THE PROMISE AND CHALLENGE OF THE MINISTRY OF AGRICULTURE/SG2000 EXPERIMENT WITH IMPROVED CEREALS TECHNOLOGY IN ETHIOPIA

STATISTICAL ANNEX AND COPIES OF QUESTIONNAIRE

by

Julie A. Howard, Valerie Kelly, Julie Stepanek, Eric W. Crawford, Mulat Demeke, and Mywish Maredia

May 1999

This paper is published by the Department of Agricultural Economics and the Department of Economics, Michigan State University (MSU). Funding for this research was provided by USAID/Ethiopia and the Food Security II Cooperative Agreement (AEP-5459-A-00-2041-00) between Michigan State University and the United States Agency for International Development, through Africa Bureau's Office of Sustainable Development, Productive Sector Growth and Environment Division (AFR/SD/PSGE).

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ISSN

Published by the Department of Agricultural Economics and the Department of Economics, Michigan State University, East Lansing, Michigan 48824-1039, U.S.A.

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APPENDIX 1: TECHNIQUES FOR YIELD ESTIMATION, AREA MEASUREMENT AND FIRST ROUND QUESTIONNAIRES

PART 1: YIELD ESTIMATION METHOD

Maize. The method used for maize plot selection (2 sample plots per field) was as follows.[1] First, enumerators asked the farmer to identify the center of the field, then stretched two ropes to transect the field at right angles. The ropes were marked with knots every 4 meters. Standing at the center of the field, the enumerator numbered the quadrants (#1 quadrant is closest to the northwest, numbering continues clockwise). The enumerator then selected two of the four quadrants for the yield sample using a random number table. S/he next (for each selected quadrant) located the starting point for the 2 m x 4 m sample plot by using a random number table and starting from the corresponding knot on the rope. The enumerator marked the area with a 2 m x 4 m bamboo frame, set stakes and cordoned off the plot with twine. S/he then recorded the number of plants and maize ears in the plot, measured the between-plant and between-row spacing, and interviewed the farmer about soil fertility, plot history, and the farmer's expected yield from the plot.

Following sample plot marking, the farmer was asked to advise the enumerator when he was ready to harvest the field. On that day the enumerator and the farmer harvested the sample plot together, and the enumerator placed the ears in a bag and carried it to the extension agent's house for safekeeping. When the farmer finished harvesting his field he came to the extension agent's house to thresh the maize. The supervisor then weighed the grain sample, took a moisture reading and returned the grain to the farmer.

Tef. The selection of sample plots in tef fields was done in a slightly different way to minimize crop damage caused by walking in the field. Farmers first identified the boundary points for the field, the enumerator numbered the points (with the point closest to the northwest labeled #1, and continuing clockwise) and used the random number table to identify a starting point. The farmer stood at this point and threw a ball of twine into the field (he was not told why). The point where the twine fell was the starting point for the 2m x 4m quadrant, and the quadrant was marked with stakes and twine as above. After the tef in the sample plot was harvested it was taken to the extension agent's house to dry. Both the grain and straw were weighed. The farmer threshed the tef and the supervisor weighed and returned the grain to the farmers.

[1] This method was based on recommendations from Drs. Rick Ward and Richard Harwood of MSU's Department of Crop and Soil Sciences and Mr. Tewabe Mihret of the Central Statistical Agency, Addis Ababa.

PART 2: TECHNIQUES FOR FIELD AREA MEASUREMENT

FIELD AREA MEASUREMENT USING THE POLY PROGRAM FOR THE HP 48G CALCULATOR

by Donald Beaver and Julie Howard[2]

Part A: Notes on measuring and calculating farm area

1. Basics. The basic idea behind field area measurement is to identify the corners of the field, use a compass to take the bearing (from North) between consecutive (moving clockwise) points, and measure the side lengths between each of the points. The bearing and side length data will be entered into the HP 48 programmable calculators and area and the percent error will automatically be calculated (see Part B for instructions on using the calculators). The program works by dividing the field up into triangles, calculating the area of each triangle and summing them. The beauty of using the programmable calculators is that you can have the enumerators take the bearings and side measurements, then immediately check the area while everyone is still in the field. If the closing error is greater than 5%, the enumerators should redo the bearings and side measurements.

2. How to measure and record field area. Starting from point A (see Figure 2), use a compass to take the bearing to the next point (moving clockwise). We found it easiest to do this work in teams, with one person standing at point A taking the bearing to point B, and the second person standing at point B, if possible marking it with a long stick with a piece of cloth tied to it. As the second person walks from point A to point B he or she can also be taking the side measurement AB at the same time with the tape measure. And so on, around the field, one person stands at point B and takes the bearing to point C, the second person marks point C with a stick and cloth and measures BC side length, etc.

The enumerators should be very careful about how they record the bearings and corresponding side lengths (see Appendix 2). They also need to roughly sketch the shape of the field, marking the corners (A,B,C,D etc.). This is important because in some cases we will have concave rather than convex polygons (see Figure 2). For a convex polygon, it doesn't matter what point you start with when entering data into the HP48 program. If the polygon is concave, though, the starting point (that is, the first point that is entered into the HP48 program) MUST be the first point beyond the concavity, moving in a clockwise direction. Otherwise the program will overestimate the field area.

Some enumerators will have a natural aptitude for using a compass, others won't. We found it useful to spend a day training all enumerators in taking bearings and measuring side lengths, then we tested them to see how well they could read the bearings on their own. We chose the best

[2]Respectively, Professor, Department of Zoology, Michigan State University, and Visiting Assistant Professor, Department of Agricultural Economics, Michigan State University

ones for specialized area measurement teams, and let the rest focus on other survey tasks.

Part B: Instructions for using HP 48G to determine farm plot area

a.. Turn the calculator ON by pressing ON key at lower left-hand corner of calculator.

b. Start the PLGY (POLYGON) program by pressing the white-capped key aligned with the "PLGY" name in the list at the bottom of the calculator display screen. If you don't see the name "PLGY" at the bottom of the screen, then press the "NXT" key (last right-hand key in the second row of calculator keys, under the row of white-capped keys). If it still doesn't appear, press the VAR key, then press NXT again. If you have started the PLGY program successfully, you will see "Irregular Polygon Area--key requested data, PRESS ENTER (any key to start) on the screen.

c. Enter the number of decimals (in your side measurements), then press enter.

d. Enter the number of sides of the field, then press enter.

e. The program will prompt you to key in each angle.

f. The program will prompt you to key in the measurement of each side (in meters).

g. The program then automatically calculates the total AREA, and gives you the percent closing error. If the percent error is greater than 5%, the field angles and sides should be re-measured.

h. The program will ask if you want to do ANOTHER RUN. Type is Y or N by pushing the alpha key (4th row from the bottom, 1st key on the left) and then pressing the corresponding key with the letter "Y" or "N," then enter.

i. To TURN THE CALCULATOR OFF, press the right-shift key (RS) (the green key located just above the ON button), then press OFF (same key as the ON key, with OFF written in green above.

j. If you make a mistake and want to reenter the data on that line, press CANCEL (the ON key).

l. EXAMPLE: Enter the following data (a rectangle of 2 hectares): Angles: 0,90,180,270. Enter each value followed by the ENTER key. Sides: 100,200,100,200. Enter each value followed by the ENTER key. Read Hectares: 2.00 and Percent Error: 0.00 in the display

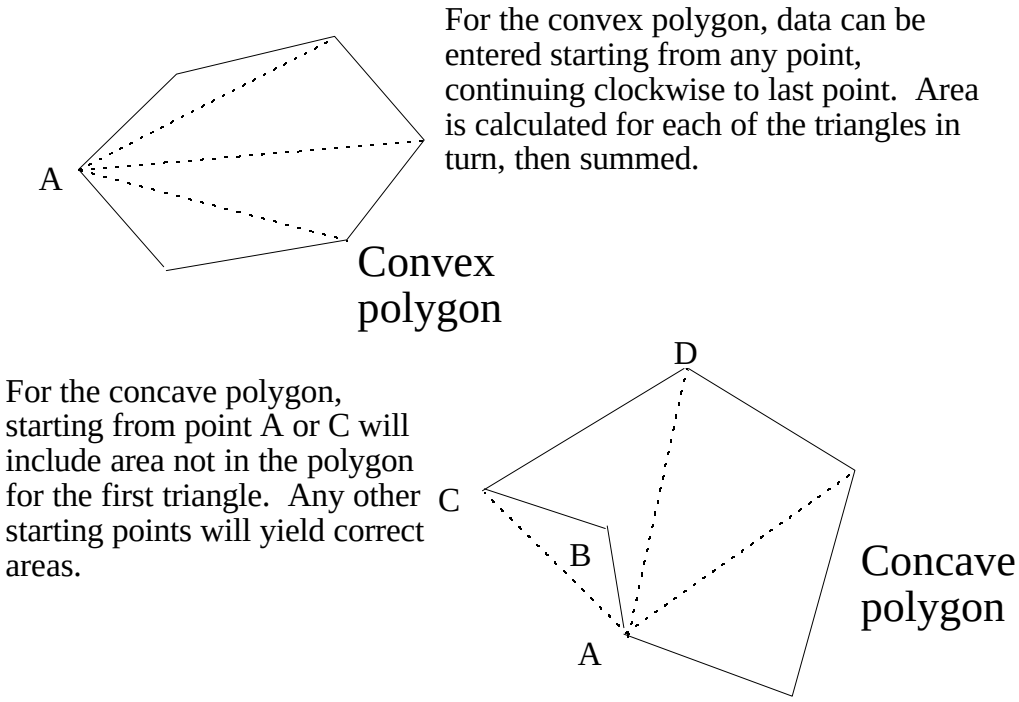

Figure 2. **Measuring Area for Convex and Concave Polygons**
The starting point must be adjusted manually for the concave case to prevent inclusion of extra area, or in very complex shaped concave polygons (more than one concavity), overlapping areas within it.

<u>Part C: Notes on concave and convex polygons and formulas used in the HP48G POLY program</u>

Entering Data:
For a convex polygon (see Figure 2), enter data for each angle and its corresponding side length, in meters, from any point, moving clockwise from that point until all data are entered.

For a concave polygon, enter data starting with the first point beyond the concavity in a clockwise direction, (point C Figure 2), and continue clockwise from there. When more than one concavity occurs. I suggest breaking the polygon into two or more polygons. Computing the area for each separately, and then add them.

Formula used for the HP48 program.

$$A = \frac{1}{2} \sum_{i=1}^{n} (Y_i \Delta X_i - X_i \Delta Y_i) + \frac{Y_n}{\dot{n}} \sum_{i=1}^{\dot{n}} X_i - \frac{X_n}{\dot{n}} \sum_{i=1}^{n} Y_i$$

Where $\Delta X_j = X_j \, Sin \, \alpha$ *and* $\Delta Y_j = Y_j \, Cos \, \alpha$

and

$$X_i = \sum_{j=1}^{i} \Delta X_j \quad \text{and} \quad Y_i = \sum_{j=1}^{i} \Delta Y_j$$

for α_j *angles and* a_j *sides, with i verticies*

The correction formula is:

$$C = \frac{\sqrt{X_n^2 + Y_n^2}}{\sum_{j=1}^{n} a_j} \cdot 100$$

Part D: POLY Program

Key-Stroke Definitions: Special Symbols

HP48 Code	Key Strokes	HP48 Code	Key Strokes
::	RS, ::	CLEAR	LS, CLEAR
?	α, LS, ⇦ (or special chars)	CLLCD	PRG, NXT, OUT, CLLCD
()	LS, ()	DISP	PRG, NXT, OUT, DISP
{}	LS, {}	DO UNTIL END	PRG, BRCH, DO, (DO) (UNTIL) (END) same for any
+ - / * √	FROM KEYBOARD	DUP	LS, STACK, NXT, DUP
= =	PRG, TEST, = =	FIX	LS, MODES, FMT, FIX
≠	PRG, TEST, ≠	GET	PRG, LIST, ELEM, GET
«»	LS, << >>	GETI	PRG, LIST, ELEM, GETI
“”	RS, “”	IF THEN ELSE	PRG, BRCH, IF, (IF) (THEN) (ELSE) Same for any
%	α, RS, U (or special chars)	INPUT	PRG, NXT, IN, INPUT
α	Next key press a capital letter, ends automatically	OBJ→	PRG, LIST, OBJ→
α α	Next and subsequent key presses capital letters; end with α	SAME	PRG, TEST, NXT, SAME
α α LS α	all lower case letter, ends with α	SQ	LS, x^2
α α LS α LS	First letter upper case, all rest lower case. (See Manual pg 2.4)	STO	STO
BEEP	PRG, NXT, OUT, NXT, BEEP		

RS = Right Shift key (lower left side, blue). LS = Left Shift key (lower left side, purple).

Entering a program using the LS «» keys shows in the HP48 as « program codes ». The markers enclose the program. Sub programs within a program are similarly marked. When entering program codes, the editor automatically inserts codes between the symbols. The editor does the same for ( ), { }, : :, and “ ” codes. I HAVE SHOWN THE CODES BELOW AS THEY APPEAR IN THE HP48 SCREEN. Most commands require a space, the SPC key, between them. **When in doubt, put in a space**. When entering letters in single or double quotes, after keying α to end letters, remember to key *right cursor*, RC, to move the cursor out of the quotes before entering the next command.

“BEEP” SUBROUTINE

HP48 Codes	Notes:
« 1500 0.1 BEEP » [[at this point, key ENTER to save and end]]	Key ENTER to save and end
‘TN’ STO [[key to store program in a variable name]]	Saved as TN

INPUT SUBROUTINE

HP48 Codes	Notes:
« INPUT OBJ→ » [[at this point, key ENTER to save and end]]	Key ENTER to save and end
‘I’ STO [[key to store program in a variable name]]	Saved as I

STARTUP PROGRAM: POLY

HP48 Codes	Notes:
« TN TN CLLCD “ Irregular Polygon Area” 2 DISP “ Key Requested Data, PRESS ENTER” 4 DISP “ (Any key to start)” 7 DISP 0 WAIT 0 FIX CLEAR 1 ‘TT’ STO 1 ‘NN’ STO TN “Decimals in Answer?” “:number:” I ‘D’ STO TN REQA » [[at this point, key ENTER to save and end]]	Key ENTER to save and end.
‘POLY’ STO [[key to store program in a variable name]]	Saved as POLY

INPUT ANGLES SUBROUTINE: REQA

HP48 Codes	Notes;
« TN “How many sides?” “:number:” I ‘CC’ STO 1 ‘TT’ STO 1 ‘NN’ STO WHILE ‘CC ≠TT-1' REPEAT TN “Key angle” NN + “:degrees:” I 1 NN STO+ 1 ‘TT’ STO+ END CC →LIST ‘BNG’ STO 1 ‘NN’ STO 1 ‘TT’ STO TN TN REQL » [[at this point, key ENTER to save and end]]	
‘REQA’ STO [[key to store program in a variable name]]	Saved as REQA

INPUT SIDE LENGTHS SUBROUTINE: REQL

HP48 Codes	Notes:
« IF ‘CC ≠TT-1' THEN TN “Key Side” NN + “:length (m):” I 1 ‘NN’ STO+ 1 ‘TT’ STO REQL ELSE TN CC →LIST ‘LEN’ STO LEN BNG SIN * ‘XL’ STO LEN BNG COS * ‘YL’ STO CLLCD “Calculating. . .” 4 DISP CALC1 END » [[at this point, key ENTER to save and end]]	Key ENTER to save and end.
‘REQL’ STO [[key to store program in a variable name]]	Saved as REQL

SUBROUTINE CALC: CALC1

HP48 Codes	Notes:
« 1 ‘NN’ STO XL NN GETI ‘XC’ STO XC NN →LIST ‘Xi’ STO DO GETI XC + ‘XC’ STO Xi XC + ‘Xi’ STO UNTIL DUP 1 = = END	Key ENTER to save and end.
Xi « + » STREAM ‘XiS’ STO	
Xi CC GET ‘LSTXI’ STO 1 ‘NN’ STO YL NN GETI ‘YC’ STO YC NN →LIST ‘Yi’ STO	
DO GETI YC + ‘YC’ STO Yi YC + ‘Yi’ STO	
UNTIL DUP 1 = = END Yi « + » STREAM ‘YiS’ STO Yi CC GET ‘LSTYI’ STO FCALC D FIX CORCT	
“ (Any key to cont.)” 7 DISP 0 WAIT TN TN CLLCD {A PCNT SUM1 SUM2 SUML SUMX SUMY XiYL YiXL LSTYI LSTXI YiS XiS YC XC Yi Xi XL YL LEN BNG CC NN TT} PURGE	
“ANOTHER RUN? (Y/N)” “” INPUT IF “Y” SAME THEN REQA ELSE TN TN {D} PURGE CLLCD “PROGRAM OVER” 4 DISP 3 WAIT CLEAR END OFF » [[at this point, key ENTER to save and end]]	
‘CALC1' STO [[key to store program in a variable name]]	Saved as CALC1

SUBROUTINE FINAL CALC: FCALC

HP48 Codes	Notes:
« Yi XL * ‘YiXL’ STO Xi YL * ‘XiYL’ STO YiXL XiYL - ‘SUM1' STO SUM1 « + » STREAM ‘SUM2' STO SUM2 LSTYI CC / XiS * LSTXI CC / YiS * - + 2 / 10000 / ‘A’ STO » [[at this point, key ENTER to save and end]]	
‘FCALC’ STO [[key to store program in a variable name]]	Saved as FCALC

SUBROUTINE CORRECT: CORCT

HP48 Codes	Notes:
« LEN « + » STREAM ‘SUML’ STO XL « + » STREAM ‘SUMX’ STO YL « + » STREAM ‘SUMY’ STO SUMX SQ SUMY SQ + √ SUML / 100 * ‘PCNT’ STO CLEAR CLLCD “ Area is: “ 2 DISP A “ Hectares” + 3 DISP “Percent error:” PCNT + “%” + 5 DISP » [[at this point, key ENTER to save and end]]	
‘CORCT’ STO [[key to store program in a variable name]]	Saved as CORCT

Part E: Area Measurements from Ethiopia to use for practice with the HP 48/Poly Program

Farm No.	Side	Bearing	Length	Area	Error
301	AB	82	48.15	0.59	2.54
	BC	156	24.05	0.58	2.54
	CD	183	44.8	0.58	2.54
	DE	205	72.8	.6	2.54
	EF	306	39.7		
	FG	9	39.45		2.54
	GH	17	31.04		
	HA	358	28.74	.6	2.54
302	AB	102	90.8	.509	.162
	BC	202	58	.509	.162
	CD	279	65.68	.51	.162
	DE	355	18.6	.511	.162
	EF	282	14.21	.51	.162
	FG	5	31.6	.51	.162
	GA	50	14.33	.51	.162

PART 3: 1ST ROUND QUESTIONNAIRES

Ministry of Economic Development and Cooperation
Grain Marketing Research Project
with the collaboration of Sasakawa-Global 2000

Survey of Input Utilization and Marketing in the Smallholder Sector (Part I)
(October-November 1997)

___ **QTYPE**

Zone _____ **ZON**

Woreda _____ **WOR**

Farmer Association _____
FA

Household Number _____
HH

Farmer Name

Enumerator _____ **ENUM**

ZON_____ WOR____ FA___ HH ___QTYPE__

1. Maize Plot

Field Map: Using a compass and tape, measure all sides and angles of the field. Sketch the field below, noting side and angle measurements.

Points	AB	BC	C -	D -	E-	F-	G-	H-	I-	J-	K-
Bearing (degrees)											
Side measurement (meters)											

Total area of field _____(square meters)

Coordinates:

North _____

East _____

ZON_____ WOR____ FA___ HH ____QTYPE__

1. Maize Plot

Table 1. Description of the Maize Field

Area of field (farmer estimate)		Other crops in this field (intercropped)			Soil type (local name)	Type of soil		Slope	Soil Fertility	Farmer's estimate of yield from this plot		Form	Tenancy
No.	Units 1.timad 2.kert 3.ha	(use codes below) *			1. koticha 2. gonbore 3. shewi 4.other (specify)	1.clay 2.medium 3.sandy	1.red 2.black 3.gray	1.level 2.gullies 3.slope 4.steep slope	1. High 2.Medium 3. Low	Qt	Unit 1.50 kg 2.100 kg 3.other (spec.)	1.grain 2.ears	1. own la 2. rented 3. sharecrop (1/3, 1/2)
I1	I 2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I15

*
1.tef 2.maize 3. wheat 4.barley 5. sorghum
6.millet 7.pulses 8. oilseeds 9.fallow 10.other (specify)

ZON_____ WOR____ FA___ HH ___QTYPE___

1. Maize Plot

Table 2. Plot History

What crops were planted in this field?** (use codes below)				Use of fertilizer and manure											
				95/96			94/95			93/94			92/93		
95/96	94/95	93/94	92/93	DAP	Urea	Manure	DAP	Urea	Manure	DAP	Urea	Manure	DAP	Urea	Manure
II1	II1	II1	II1	II2	II3	II4	II2	II3	II4	II2	II3	II4	II2	II3	II4

**
1.tef 2.maize 3. wheat 4.barley 5. sorghum
6.millet 7.pulses 8. oilseeds 9.fallow 10.other (specify)

ZON_____ WOR____ FA___ HH ____QTYPE__

1. Maize Plot

Table 3. Sample Plot Data for Yield Estimation

Selected 2 x 4 meter plot	No. plants	No. ears	Distance between plants (cm)	Distance between rows (cm)	No. seeds/hill	Amt. of fertilizer used per hill during planting (basal)		Amt. of fertilizer used per hill as a top dressing		Weight of grain after harvest (kg)	Moisture content (%)
						Qt.	Units 1.Coke cap 2.spoon 3.other (specify)	Qt	Units 1.Coke cap 2.spoon 3.other (specify)		
III1	III6	III7	III8	III9	III10	III11	III12	III13	III14	III3	III5
1											
2											

Ministry of Economic Development and Cooperation
Grain Marketing Research Project
with the collaboration of Sasakawa-Global 2000

Survey of Input Utilization and Marketing in the Smallholder Sector (Part I)
(October-November 1997)

a. (Tef) ___ **QTYPE**

Zone _____ **ZON**

Woreda _____ **WOR**

Farmer Association _____
FA

Household Number _____
HH

Farmer Name

Enumerator _____ **ENUM**

ZON_____ WOR____ FA___ HH ___QTYPE__

1. Tef Plot

Field Map: Using a compass and tape, measure all sides and angles of the field. Sketch the field below, noting side and angle measurements.

Points	AB	BC	C -	D -	E-	F-	G-	H-	I-	J-	K-
Bearing (degrees)											
Side measurement (meters)											

Total area of field _____(square meters)

Coordinates:

North _____

East _____

ZON_____ WOR____ FA___ HH ____QTYPE__

1. Tef Plot

Table 1. Description of the Tef Field

Area of field (farmer estimate)		Other crops in this field (intercropped)			Soil type (local name)	Type of soil		Slope	Soil Fertility	Farmer's estimate of yield from this plot		Form	Tenancy
No.	Units 1.timad 2.kert 3.ha	(use codes below) *			1. koticha 2. gonbore 3. shewi 4.other (specify)	1.clay 2.medium 3.sandy	1.red 2.black 3.gray	1.level 2.gullies 3.slope 4.steep slope	1. High 2.Medium 3. Low	Qt	Unit 1.50 kg 2.100 kg 3.other (spec.)	1.grain 2.ears	1. own land 2. rented 3. sharecropped (1/3, 1/2)
I1	I 2	I3	I4	I5	I**6**	I**7**	I**8**	I**9**	I**10**	I**11**	I**12**	I**13**	I**15**

*
1.tef 2.maize 3. wheat 4.barley 5. sorghum
6.millet 7.pulses 8. oilseeds 9.fallow 10.other (specify)

ZON_____ WOR____ FA___ HH ____QTYPE____

1. Tef Plot

Table 2. Plot History

What crops were planted in this field?** (use codes below)				Use of fertilizer and manure											
				95/96			94/95			93/94			92/93		
95/96	94/95	93/94	92/93	DAP	Urea	Manure	DAP	Urea	Manure	DAP	Urea	Manure	DAP	Urea	Manure
II1	II1	II1	II1	II2	II3	II4	II2	II3	II4	II2	II3	II4	II2	II3	II4

**

1.tef 2.maize 3. wheat 4.barley 5. sorghum
6.millet 7.pulses 8. oilseeds 9.fallow 10.other (specify)

ZON_____ WOR____ FA___ HH ____QTYPE__

1. Tef Plot

Table 3. Sample Plot Data for Yield Estimation

Selected 2 x 4 meter plot	Weight of grain and straw before threshing (kgs)	Weight after threshing (kgs)		Moisture content(%)
		Grain	Straw	
III1	III2	III3	III4	III5
1				
2				

APPENDIX 2: 2ND ROUND QUESTIONNAIRES

MINISTRY OF ECONOMIC DEVELOPMENT AND COOPERATION
GRAIN MARKETING RESEARCH PROJECT
with the collaboration of
Sasakawa-Global 2000

Survey of Input Utilization and Marketing in the Smallholder Sector — PART II
October-November 1997

CURRENT SG PARTICIPANT: MAIZE

_____QTYPE

Zone	_____	**ZON**
Woreda	_____	**WOR**
Farmer Association	_____	**FA**
Household Number	_____	**HH**
Name of Farmer	_____	
Enumerator	_____	**ENUM**

In what years have you participated in the SG2000 program (mark all appropriate)? No=0 Yes=1
96/97 season (this season)? _____S9697
95/96 season? _____S9596
94/95 season? _____S9495
93/94 season? _____S9394
92/93 season? _____S9293
In what years have you participated in the government extension program (mark all appropriate)? No=0 Yes=1
96/97 season (this season)? _____P9697
95/96 season? _____P9596
94/95 season? _____P9495
93/94 season? _____P9394
AF1 Household head's level of education
0 Illiterate
1,2,...12 Last year of school completed
99 Did not attend public school, but knows how to read and write (includes religious school)

3. CURRENT SG2000 PROGRAM PARTICIPANT/MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

PART I. THE FARM

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON

YEAR	CROP #1															
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			In	
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV1
9697																
9596																
9495																
9394																
9293																

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

3. CURRENT SG2000 PROGRAM PARTICIPANT/MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	CROP #2																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

3. CURRENT SG2000 PROGRAM PARTICIPANT/MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	CROP #3																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	1 2 3 4 2 (
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	I
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

3. CURRENT SG2000 PROGRAM PARTICIPANT/MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON

YEAR	CROP #4																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

3. CURRENT SG2000 PROGRAM PARTICIPANT/MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	CROP #5																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	FALLOW/GRAZING AREA				
	CROP/ LAND USE type	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land	
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other
YEAR	CROP	IV1	IV2	IV3	IV4
9697	11				
9596	11				
9495	11				
9394	11				
9293	11				

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 11=fallow 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

AF2 _____ Has the total area (owned, rented, sharecropped or borrowed) planted to maize changed between 1992-93 and the current season?

0 = no change
1 = area planted to maize has increased slightly
2 = area planted to maize has increased significantly
3 = area planted to maize has decreased slightly
4 = area planted to maize has decreased significantly

If there was a change in maize area between 1992-93, give the three most important reasons for the area increase/decrease in order of importance:

AF3_____
AF4_____
AF5_____

AF6 _____ Do you plan to increase, decrease or maintain the area planted to maize during the 1997-98 season (next season?)

0 = no change
1 = will slightly increase area planted to maize
2 = will increase area planted to maize significantly
3 = will slightly decrease area planted to maize
4 = will decrease area planted to maize significantly

If you plan to increase or decrease the area planted to maize next season, give the three most important reasons why:

AF7_____

A8_____

AF9_____

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table V. LIVESTOCK HOLDINGS

YEAR	LIVESTOCK 1		LIVESTOCK 2		LIVESTOCK 3		LIVESTOCK 4		LIVESTOCK 5		LIVESTOCK 6		LIVESTOCK 7	
	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.
YEAR	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO
9697														
9596														
9495														
9394														
9293														

*** Livestock type codes**
1= plowing oxen **2= steers** **3= cows/heifers**
4= calves (< 2 years) **5= horses** **6= donkeys**
7= sheep and goats

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

PART II. THE HOUSEHOLD

Table VI. DEMOGRAPHIC DATA ABOUT THE HOUSEHOLD*

Name	No.	Relationship to household head 1 household head 2 spouse 3 son/daughter 4 father/ mother 5 other relative 6 hired help eating with the household 7 other (specify)	Age**	Sex 1 m 2 f
	NO	VI1	VI2	VI3
(Household head)	1	1		
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			

NOTES FOR ENUMERATORS

*** The HOUSEHOLD is defined as persons living in the same compound who regularly eat together.**

**** AGE variable**

1. Enumerators should first ask household helds for the exact age of household members in years.

2. The age of children less than 1 year of age (e.g., 3 months) should be recorded as "1."

3. If household heads cannot recall the exact age of household members, prompt for the birth year using the following list of significant historical events:

4. If household heads still cannot recall the birth year, as a last resort categorize the age of family members as follows:

101 = < 7 years of age
102 = (>=7, <=8)
103 = (>=9,<=12)
104 = (>=13, <=15)
105 = (>=16, <=54)
106 = (>=55)

PART III. THE SG2000 PROGRAM MAIZE PLOT 1

WORKSHEET: MAIZE FIELD ACTIVITIES

Activity	Power Source 1=Tractor 2=Animal 3=Human 4=Human and Animal	When was it carried out?	
		Month (1,2,...,12 or indicate that not done)	Week (START DATE)* (1,2,3,4)
1 Seed treatment			
2 Clearing new land			
3 Removing crop stubble			
4 Bund making			
10 1st Plowing			
11 2nd Plowing			
12 3rd Plowing			
13 4th Plowing			
14 5th Plowing			
16 Plowing for planting/making rows			
20 Planting seeds			
21 Planting seeds and 1st application of fertilizer (DAP and/or Urea) AT THE SAME TIME			
30 1st application of fertilizer (DAP and/or Urea)			
22 Covering seeds			
23 Trampling/leveling			
40 Application of herbicide			
41 1st weeding			
43 Thinning			
44 Cultivation			
31 2nd application of fertilizer (Urea)			
42 2nd weeding			
50 1st application of insecticide			
51 2nd application of insecticide			
60 1st application of fungicide			
61 2nd application of fungicide			
70 Harvest			
80 Transport to threshing area			
91 Dehusking/shelling			
81 Transport to storage area			
100 Other (specify)			

*** Enumerators should try to get the farmer to recall the specific WEEK in which the activity was carried out. If the farmer cannot remember the week, prompt for a 2-week period and record this as e.g., WEEK 1-2, WEEK 3-4.**

AF10 **Is the 1996/97 threshing complete? 0 = no 1=yes**

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON______WOR______FA______HH______QTYPE______ENUM_____

Table VII. LABOR USED IN THE SG2000 PROGRAM MAIZE PLOT __1__

Activity	When was it carried out?		How many total labor days were spent on this activity (household and non-household labor)?	Household labor				Non-household labor											
	Mo. 1,2., 12	Week 1,2,3,4		How many persons in the household worked in this activity?	Name	Days	Hours per day	Total number of non-household workers for activity	Type of non-household labor 1=debo 2=wonfel 3=friends/ relatives 4=hired 5=exch. for oxen	No.of (individual) worker	No. of days	Hrs per day	Total cash payment (birr)	If in-kind payment was made				Type of mea ** (use cod	
														Type * (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=ox days 20=other (specify)	Total est. value of in-kind payment in birr	Type# 1	Typ 2
ACT	VII1	VII2	VII3	VII4	VII5	VII6	VII7	VII8	VII9	VII10	VII11	VII12	VII13	VII14	VII15	VII16	VII17	VII18	VII
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									

*** In-kind Payment Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
=millet 7=pulses 8=oilseeds 20=other (specify) 50=use of oxen

**** Meal Codes:**
1=lunch 2=dinner3=local drink

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table VIII. INPUTS USED IN THE SG2000 PROGRAM MAIZE PLOT ___1____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	**VIII1**	**VIII2**	**VIII3**	**VIII4**	**VIII5**	**VIII6**	**VIII7**	**VIII8**	**VIII9**	**VIII10**	**VIII11**	**VIII12**
100 Seed Treatment Type_____ Type_____												
200 Seed Variety (ies) _____ _____ _____												
Animal Traction												
4 Making Bunds												
10 First Plowing												
11 Second Plowing												
12 Third Plowing												
13 Fourth Plowing												
14 Fifth Plowing												
16 Plowing for planting/making rows												
23 Trampling/leveling												
44 Cultivation												

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
80 Transport to threshing area												
91 Shelling												
81 Transport to storage area												
Tractor												
10 First Plowing												
11 Second Plowing												
Other Inputs												
300 DAP Fertilizer												
400 Urea Fertilizer												
500 Herbicide Type/form. _____												
600 Field Insecticide Type/form. _____												

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
800 Fungicide Type/form. _____												
700 Storage Insecticide _____												
Other _____												

AF11 _____ **Did you split the application of urea during the current season?**

0 = no
1 = yes

If yes, how did you split it?

AF12 _____ **kgs at broadcasting**

AF13 _____ **kgs as top dressing**

Table IX. Impact of Purchased Inputs on Maize Yield and Future Input Use

Input	Impact on yield	When did you receive this input?				If you had to pay for this input immediately (instead of receiving credit), would you purchase it?	Rank each in order of importan
	1 Improved yield/storage 2 No impact on yield/storage 3 Reduced yield/stored grain 4 Doesn't know	Month 1...12	Week 1...4	Timing 1=on time or early 2=slightly late 3=very late	If late, reason why 1=delay in receiving credit (specify why) 2=lack of cash 3=input unavailable in shops 4=other (specify)	0 Would not buy 1 Would buy	(1=most imp 6=least impo
INPUT	IX1	IX2	IX3	IX4	IX5	IX6	IX7
200 Improved seed							
300 DAP							
400 Urea							
500 Herbicide							
800 Fungicide							
600 Field Insecticide							
700 Storage Insecticide							

Table X. FARMER ASSESSMENT OF FACTORS AFFECTING MAIZE YIELD 1993/94 - 97/98

Note to enumerator: For each topic, ask the farmer for his assessment of this year (96-97), last year (95-96), two years ago (94-95), three years ago (93-94), four years ago (92-93). Finally, ask what he expects the situation to be next year (97-98).

YEAR	Total amount of rainfall received	Distribution of rainfall	Hail and frost damage	Wild animal damage	Insect infestation	Plant disease problem	Weed infestat
	1=excess rain 2=good rains 3=shortage of rain 4=can't recall	1=excellent 2=good 3=poor 4=can't recall	1=hail damage 2=frost damage 3=hail and frost damage 4 =no damage 5=can't recall	1=light 2=medium 3=heavy 4=can't recall	1=light 2=medium 3=heavy 4=can't recall	1=light 2=medium 3=heavy 4=can't recall	1=light 2=medium 3=heavy 4=can't recall
YEAR	X1	X2	X3	X4	X5	X6	X7
9697 (this season)							
9596							
9495							
9394							
9293							
9798 (expectation for next season)							

PART IV. SG2000/EXTENSION

AF14 **During this season (96/97), how many times were you visited by the extension agent?**

AF15 **How do you view the services provided by the extension department?**

1 **Very useful**
2 **Useful**
3 **Not very useful**
4 **No comment**

What are the two most important extension messages you received during this season (96/97)?

AF16 _____

_____

AF17 _____

_____

CP1 **If the SG2000 program continues next year, would you like to participate or do you prefer to leave the program?**

1 Would like to participate
2 Prefers to leave

CP2 **If you prefer to leave, why?**

CP3 **Do you have additional comments about the SG2000 program or the technologies used in the program?**

PART V. MARKETING/CONSUMPTION

AF18 **How does the color of improved maize compare to traditional varieties?**

1 Prefers improved maize
2 Doesn't see any difference
3 Prefers the traditional varieties
4 Doesn't know

AF19 **How does the taste of improved maize compare to traditional varieties?**

1 Prefers improved maize
2 No difference
3 Prefers the traditional varieties
4 Doesn't know

AF20 **What is the principal destination for the TRADITIONAL varieties of maize you produce?**

1 Market
2 Home consumption
3 Both

AF21 **What is the principal destination for the improved varieties of maize you produce?**

1 Market
2 Home consumption
3 Both

AF22 **How does the PRICE that traders pay for improved maize compare to the price paid for traditional varieties?**

1 Pay more for improved maize
2 Pay the same
3 Pay less for improved maize
4 Doesn't know

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

TABLE XI. MARKETING OF MAIZE

YEAR	TOTAL PRODUCTION OF MAIZE		TOTAL CONSUMPTION BY HOUSEHOLD		QUANTITY MARKETED		MONTH WHEN LARGEST QTY OF MAIZE SOLD	MAIN BUYER	DISTANCE TO MAIN BUYER	METHOD OF TRANS-PORT	PRICE RECEIVED			
	Qty.	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Month 1...12	1=village trader 2=local market 3=trader with truck 20=other (specify)	kms	1=human 2=animal 3=motor vehicle 4=human and animal	Price (Birr)	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Opinion about price received 1=low 2=avg. 3=high	Sou pri info 1=r 2=r 3=l ma e 20= (sp
YEAR	XI1	XI2	XI3	XI4	XI5	XI6	XI7	XI8	XI9	XI10	XI11	XI12	XI13	XI1
9596														
9495														
9394														
9293														
Plans for 9697														

PART VI. TRADITIONAL MAIZE PLOT 2

WORKSHEET: MAIZE FIELD ACTIVITIES

Activity	Power Source 1=Tractor 2=Animal 3=Human 4=Human and Animal	When was it carried out?	
		Month (1,2,...,12 or indicate that not done)	Week (START DATE)* (1,2,3,4)
1 Seed treatment			
2 Clearing new land			
3 Removing crop stubble			
4 Bund making			
10 1st Plowing			
11 2nd Plowing			
12 3rd Plowing			
13 4th Plowing			
14 5th Plowing			
16 Plowing for planting/making rows			
20 Planting seeds			
21 Planting seeds and 1st application of fertilizer (DAP and/or Urea) AT THE SAME TIME			
30 1st application of fertilizer (DAP and/or Urea)			
22 Covering seeds			
23 Trampling/leveling			
40 Application of herbicide			
41 1st weeding			
43 Thinning			
44 Cultivation			
31 2nd application of fertilizer (Urea)			
42 2nd weeding			
50 1st application of insecticide			
51 2nd application of insecticide			
60 1st application of fungicide			
61 2nd application of fungicide			

70 Harvest			
80 Transport to threshing area			
91 Dehusking/shelling			
81 Transport to storage area			
100 Other (specify)			

*** Enumerators should try to get the farmer to recall the specific WEEK in which the activity was carried out. If the farmer cannot remember the week, prompt for a 2-week period and record this as e.g., WEEK 1-2, WEEK 3-4.**

CP4 **Is the 1996/97 threshing complete?**
0 = no
1= yes

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE **ZON______WOR______FA______HH______QTYPE______ENUM_____**

Table XII. LABOR USED IN THE TRADITIONAL MAIZE PLOT __2__

Activity	**When was it carried out?**		**How many total labor days were spent on this activity (household and non-household labor)?**	**Household labor**				**Non-household labor**											
	Mo. 1,2., 12	**Week 1,2,3,4**		**How many persons in the household worked in this activity?**	**Name**	**Days**	**Hours per day**	**Total number of non-household workers for activity**	**Type of non-household labor** **1=debo** **2=wonfel** **3=friends/ relatives** **4=hired** **5=exch. for oxen**	**No.of (indiv-idual) worker**	**No. of days**	**Hrs per day**	**Total cash payment (birr)**	**If in-kind payment was made**				**Type of mea ** (use cod**	
														Type * (use codes below)	**Qty.**	**Unit** **1=50 kg** **2=100 kg** **3=kg** **4=liter** **5=ox days** **20=other (specify)**	**Total est. value of in-kind payment in birr**	**Type# 1**	**Typ 2**
ACT	**VII1**	**VII2**	**VII3**	**VII4**	**VII5**	**VII6**	**VII7**	**VII8**	**VII9**	**VII10**	**VII11**	**VII12**	**VII13**	**VII14**	**VII15**	**VII16**	**VII17**	**VII18**	**VII1**
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									

*** In-kind Payment Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
=millet 7=pulses 8=oilseeds 20=other (specify) 50=use of oxen

**** Meal Codes:**
1=lunch 2=dinner3=local drink

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table XIII. INPUTS USED IN THE TRADITIONAL MAIZE PLOT 2

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
100 Seed Treatment Type_____ Type_____												
200 Seed Variety (ies) _____ _____ _____												
Animal Traction												
4 Making Bunds												
10 First Plowing												
11 Second Plowing												
12 Third Plowing												
13 Fourth Plowing												
14 Fifth Plowing												
16 Plowing for planting/making rows												
23 Trampling/leveling												
44 Cultivation												

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
80 Transport to threshing area												
91 Shelling												
81 Transport to storage area												
Tractor												
10 First Plowing												
11 Second Plowing												
Other Inputs												
300 DAP Fertilizer												
400 Urea Fertilizer												
500 Herbicide Type/form. _____												
600 Field Insecticide Type/form. _____												

3. CURRENT SG2000 PROGRAM PARTICIPANT / MAIZE ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
800 Fungicide Type/form. _____												
700 Storage Insecticide _____												
Other _____												

CP5 _____ **Did you split the application of urea during the current season?**

0 = no
1 = yes

If yes, how did you split it?

CP6 _____ **kgs at broadcasting**

CP7 _____ **kgs as top dressing**

MINISTRY OF ECONOMIC DEVELOPMENT AND COOPERATION
GRAIN MARKETING RESEARCH PROJECT
with the collaboration of
Sasakawa-Global 2000

Survey of Input Utilization and Marketing in the Smallholder Sector — PART II
October-November 1997

1. To be filled out only by farmers currently participating in the SG2000/government extension program (tef)
_____QTYPE

Zone	_____	**ZON**
Woreda	_____	**WOR**
Farmer Association	_____	**FA**
Household Number	_____	**HH**
Name of Farmer	_____	
Enumerator	_____	**ENUM**

In what years have you participated in the SG2000 program (mark all appropriate)? No=0 Yes=1
96/97 season (this season)? _____S9697
95/96 season? _____S9596
94/95 season? _____S9495
93/94 season? _____S9394
92/93 season? _____S9293

In what years have you participated in the government extension program (mark all appropriate)? No=0 Yes=1
96/97 season (this season)? _____P9697
95/96 season? _____P9596
94/95 season? _____P9495
93/94 season? _____P9394
AF1 Household head's level of education

0	**Illiterate**
1,2,...12	**Last year of school completed**
99	**Did not attend public school, but knows how to read and write (includes religious school)**

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

PART I. THE FARM

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON

YEAR	CROP #1																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	CROP #2																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	1 2 3 4 2 (
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	I
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	CROP #3																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON

YEAR	CROP #4																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	CROP #5																
	CROP	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land		Input #1			Input #2			Input #3			Input #4		
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)ce	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 20=other (specify)	Type ** (use codes below)	Qty.	
YEAR	CROP	IV1	IV2	IV3	IV4	IV5	IV6	IV7	IV8	IV9	IV10	IV11	IV12	IV13	IV14	IV15	
9697																	
9596																	
9495																	
9394																	
9293																	

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IV. AREA AND INPUT USE ON MAJOR CROPS IN MEHER SEASON (CON'T)

YEAR	FALLOW/GRAZING AREA				
	CROP/ LAND USE type	Area — Own Land		Area — Rented, Sharecropped or Borrowed Land	
	* (use codes below)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other (specify)	No.	Unit 1=timad 2=kert 3=ha 4=fachasa 20=other
YEAR	CROP	IV1	IV2	IV3	IV4
9697	11				
9596	11				
9495	11				
9394	11				
9293	11				

*** Crop Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
6=millet 7=pulses 8=oilseeds 11=fallow 20=other (specify)

**** Input Type Codes**
100=Seed treatment 200=improved seed 300=DAP 400=Urea
500=herbicide 600=field insecticide 700=storage insecticide800=fungicide

AF2 _____ **Has the total area (owned, rented, sharecropped or borrowed) planted to tef changed between 1992-93 and the current season?**

0 = no change
1 = area planted to tef has increased slightly
2 = area planted to tef has increased significantly
3 = area planted to tef has decreased slightly
4 = area planted to tef has decreased significantly

If there was a change in tef area between 1992-93, give the three most important reasons for the area increase/decrease in order of importance:

AF3_____

AF4_____

AF5_____

AF6 _____ **Do you plan to increase, decrease or maintain the same area planted to tef during the 1997-98 season (next season?)**

0 = no change
1 = will slightly increase area planted to tef
2 = will increase area planted to tef significantly
3 = will slightly decrease area planted to tef
4 = will decrease area planted to tef significantly

If you plan to increase or decrease the area planted to tef next season, give the three most important reasons why:

AF7_____

AF8_____

AF9_____

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table V. LIVESTOCK HOLDINGS

YEAR	LIVESTOCK 1		LIVESTOCK 2		LIVESTOCK 3		LIVESTOCK 4		LIVESTOCK 5		LIVESTOCK 6		LIVESTOCK 7	
	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No.	Type * (use codes below)	No
YEAR	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NO	LIVE	NC
9697														
9596														
9495														
9394														
9293														

*** Livestock type codes**
1= plowing oxen **2= steers** **3= cows/heifers**
4= calves (< 2 years) **5= horses** **6= donkeys**
7= sheep and goats

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

PART II. THE HOUSEHOLD

Table VI. DEMOGRAPHIC DATA ABOUT THE HOUSEHOLD*

Name	No.	Relationship to household head 1 household head 2 spouse 3 son/daughter 4 father/ mother 5 other relative 6 hired help eating with the household 7 other (specify)	Age**	Sex 1 m 2 f
	NO	VI1	VI2	VI3
(Household head)	1	1		
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

NOTES FOR ENUMERATORS

*** The HOUSEHOLD is defined as persons living in the same compound who regularly eat together.**

**** AGE variable**

1. Enumerators should first ask household helds for the exact age of household members in years.

2. The age of children less than 1 year of age (e.g., 3 months) should be recorded as "1."

3. If household heads cannot recall the exact age of household members, prompt for the birth year using the following list of significant historical events:

4. If household heads still cannot recall the birth year, as a last resort categorize the age of family members as follows:

101 = < 7 years of age
102 = (>=7, <=8)
103 = (>=9,<=12)
104 = (>=13, <=15)
105 = (>=16, <=54)
106 = (>=55)

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

PART III. THE SG2000/GOV'T EXTENSION PROGRAM TEF PLOT 1

WORKSHEET: TEF FIELD ACTIVITIES

Activity	Power Source 1=Tractor 2=Animal 3=Human 4=Human and Animal	When was it carried out?	
		Month (1,2,...,12 or indicate that not done)	Week (START DATE)* (1,2,3,4)
2 Clearing New Land			
3 Removing Crop Stubble			
10 1st Plowing			
11 2nd Plowing			
12 3rd Plowing			
13 4th Plowing			
14 5th Plowing			
15 6th Plowing			
20 Broadcasting seeds			
21 Broadcasting seeds and 1st application of fertilizer (DAP and/or Urea) AT THE SAME TIME			
30 1st application of fertilizer (DAP and/or Urea)			
23 Trampling/leveling			
40 Application of herbicide			
41 1st weeding			
31 2nd application of fertilizer (Urea)			
42 2nd weeding			
50 1st application of insecticide			
51 2nd application of insecticide			
70 Harvest			
80 Transport to threshing area			
90 Threshing and winnowing			
81 Transport to storage area			
100 Other (specify)			

*** Enumerators should try to get the farmer to recall the specific WEEK in which the activity was carried out. If the farmer cannot remember the week, prompt for a 2-week period and record this as e.g., WEEK 1-2, WEEK 3-4.**

AF10 **Is the 1996/97 threshing complete?**
0 = no 1=yes

Table VII. LABOR USED IN THE SG2000/GOV'T EXTENSION PROGRAM TEF PLOT 1

1. **CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_________WOR_________FA_________HH_________QTYPE_________ENUM_________**

Activity	When was it carried out?		How many total labor days were spent on this activity (household and non-household labor)?	Household labor				Non-household labor												
	Mo. 1,2., 12	Week 1,2,3,4		How many persons in the household worked in this activity?	Name	Days	Hours per day	Total number of non-household workers for activity	Type of non-household labor 1=debo 2=wonfel 3=friends/ relatives 4=hired 5=exch. for oxen	No.of (individual) worker	No. of days	Hrs per day	Total cash payment (birr)	If in-kind payment was made				Type of meal provided ** (use codes below)		
														Type * (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=ox days 20=other (specify)	Total est. value of in-kind payment in birr	Type# 1	Type# 2	Type# 3
ACT	VII1	VII2	VII3	VII4	VII5	VII6	VII7	VII8	VII9	VII10	VII11	VII12	VII13	VII14	VII15	VII16	VII17	VII18	VII19	VII20
										1										
										2										
										3										
										4										
										1										
										2										
										3										
										4										
										1										
										2										
										3										
										4										
										1										
										2										
										3										
										4										

*** In-kind Payment Codes:**
1=tef 2=maize 3=wheat 4=barley 5=sorghum
=millet 7=pulses 8=oilseeds 20=other (specify) 50=use of oxen

**** Meal Codes:**
1=lunch 2=dinner3=local drink

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table VIII. INPUTS USED IN THE SG2000/GOV'T EXTENSION PROGRAM TEF PLOT ___1___

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
100 Seed Treatment Type_____ Type_____												
200 Seed Variety (ies) _____ _____ _____												
Animal Traction												
10 First Plowing												
11 Second Plowing												
12 Third Plowing												
13 Fourth Plowing												
14 Fifth Plowing												
15 Sixth Plowing												
23 Trampling/leveling												
80 Transport to threshing area												

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
81 Transport to storage area												

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
Tractor												
10 First Plowing												
11 Second Plowing												
Other Inputs												
300 DAP Fertilizer												
400 Urea Fertilizer												
500 Herbicide Type/form. _____												
600 Field Insecticide Type/form. _____												
Other _____												

AF11 _____ Did you split the application of urea during the current season?

0 = no
1 = yes

If yes, how did you split it?

AF12 _____ kgs at broadcasting

AF13 _____ kgs as top dressing

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table IX. Impact of Purchased Inputs on Tef Yield and Future Input Use

Input	Impact on yield	When did you receive this input?				If you had to pay for this input immediately (instead of receiving credit), would you purchase it?	Rank each in order of importan
	1 Improved yield/storage 2 No impact on yield/storage 3 Reduced yield/stored grain 4 Doesn't know	Month 1...12	Week 1...4	Timing 1=on time or early 2=slightly late 3=very late	If late, reason why 1=delay in receiving credit (specify why) 2=lack of cash 3=input unavailable in shops 4=other (specify)	0 Would not buy 1 Would buy	(1=most imp 6=least impo
INPUT	IX1	IX2	IX3	IX4	IX5	IX6	IX7
200 Improved seed							
300 DAP							
400 Urea							
500 Herbicide							
600 Field Insecticide							
700 Storage Insecticide							

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table X. FARMER ASSESSMENT OF FACTORS AFFECTING TEF YIELD 1993/94 - 97/98

Note to enumerator: For each topic, ask the farmer for his assessment of this year (96-97), last year (95-96), two years ago (94-95), three years ago (93-94), four years ago (92-93). Finally, ask what he expects the situation to be next year (97-98).

YEAR	Total amount of rainfall received	Distribution of rainfall	Hail and frost damage	Wild animal damage	Insect infestation	Plant disease problem	Weed infestatio
	1=excess rain 2=good rains 3=shortage of rain 4=can't recall	1=excellent 2=good 3=poor 4=can't recall	1=hail damage 2=frost damage 3=hail and frost damage 4 =no damage 5=can't recall	1=light 2=medium 3=heavy 4=can't recall	1=light 2=medium 3=heavy 4=can't recall	1=light 2=medium 3=heavy 4=can't recall	1=light 2=medium 3=heavy 4=can't recall
YEAR	X1	X2	X3	X4	X5	X6	X7
9697 (this season)							
9596							
9495							
9394							
9293							
9798 (expectation for next season)							

PART IV. EXTENSION

AF14 **During this season (96/97), how many times were you visited by the extension agent?**

AF15 **How do you view the services provided by the extension department?**

1	**Very useful**
2	**Useful**
3	**Not very useful**
4	**No comment**

What are the two most important extension messages you received during this season (96/97)?

AF16 _____

_____

AF17 _____

_____

CP1 **If the SG2000/government extension program continues next year, would you like to participate or do you prefer to leave the program?**

1	**Would like to participate**
2	**Prefers to leave**

CP2 **If you prefer to leave, why?**

_____

_____

_____

CP3 **Do you have additional comments about the SG2000/government extension program or the technologies used in the program?**

_____

_____

PART V. MARKETING/CONSUMPTION

AF18 **How does the color of improved tef compare to traditional varieties?**

1	**Prefers improved tef**
2	**Doesn't see any difference**
3	**Prefers the traditional varieties**
4	**Doesn't know**

AF19 **How does the taste of improved tef compare to traditional varieties?**

1 **Prefers improved tef**
2 **No difference**
3 **Prefers the traditional varieties**
4 **Doesn't know**

AF20 **What is the principal destination for the TRADITIONAL varieties of tef you produce?**

1 **Market**
2 **Home consumption**
3 **Both**

AF21 **What is the principal destination for the improved varieties of tef you produce?**

1 **Market**
2 **Home consumption**
3 **Both**

AF22 **How does the PRICE that traders pay for improved tef compare to the price paid for traditional varieties?**

1 **Pay more for improved tef**
2 **Pay the same**
3 **Pay less for improved tef**
4 **Doesn't know**

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

TABLE XI. MARKETING OF TEF

YEAR	TOTAL PRODUCTION OF TEF		TOTAL CONSUMPTION BY HOUSEHOLD		QUANTITY MARKETED		MONTH WHEN LARGEST QTY OF TEF SOLD	MAIN BUYER	DISTANCE TO MAIN BUYER	METHOD OF TRANS-PORT	PRICE RECEIVED			
	Qty.	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Month 1...12	1=village trader 2=local market 3=trader with truck 20=other (specify)	kms	1=human 2=animal 3=motor vehicle 4=human and animal	Price (Birr)	Unit 1=50 kg 2=100 kg 3=kg 20=other (specify)	Opinion about price received 1=low 2=avg. 3=high	Sou pri info 1=r 2=r 3=l ma e 20= (sp
YEAR	XI1	XI2	XI3	XI4	XI5	XI6	XI7	XI8	XI9	XI10	XI11	XI12	XI13	XI1
9596														
9495														
9394														
9293														
Plans for 9697														

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

PART VI. TRADITIONAL TEF PLOT 2

WORKSHEET: TEF FIELD ACTIVITIES

Activity	Power Source 1=Tractor 2=Animal 3=Human 4=Human and Animal	When was it carried out?	
		Month (1,2,...,12 or indicate that not done)	Week (START DATE)* (1,2,3,4)
2 Clearing New Land			
3 Removing Crop Stubble			
10 1st Plowing			
11 2nd Plowing			
12 3rd Plowing			
13 4th Plowing			
14 5th Plowing			
15 6th Plowing			
20 Broadcasting seeds			
21 Broadcasting seeds and 1st application of fertilizer (DAP and/or Urea) AT THE SAME TIME			
30 1st application of fertilizer (DAP and/or Urea)			
23 Trampling/leveling			
40 Application of herbicide			
41 1st weeding			
31 2nd application of fertilizer (Urea)			
42 2nd weeding			
50 1st application of insecticide			
51 2nd application of insecticide			
70 Harvest			
80 Transport to threshing area			
90 Threshing and winnowing			
81 Transport to storage area			
100 Other (specify)			

*** Enumerators should try to get the farmer to recall the specific WEEK in which the activity was carried out. If the farmer cannot remember the week, prompt for a 2-week period and record this as e.g., WEEK 1-2, WEEK 3-4.**

CP4 **Is the 1996/97 threshing complete?**
0 = no
1= yes

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON________WOR________FA________HH________QTYPE________ENUM________

Table XII. LABOR USED IN THE TRADITIONAL TEF PLOT ___2____

Activity	When was it carried out?		How many total labor days were spent on this activity (household and non-household labor)?	Household labor				Non-household labor											
	Mo. 1,2., 12	Week 1,2,3,4		How many persons in the household worked in this activity?	Name	Days	Hours per day	Total number of non-household workers for activity	Type of non-household labor 1=debo 2=wonfel 3=friends/ relatives 4=hired 5=exch. for oxen	No.of (individual) worker	No. of days	Hrs per day	Total cash payment (birr)	If in-kind payment was made				Type of mea ** (use cod	
														Type * (use codes below)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=ox days 20=other (specify)	Total est. value of in-kind payment in birr	Type# 1	Typ 2
ACT	VII1	VII2	VII3	VII4	VII5	VII6	VII7	VII8	VII9	VII10	VII11	VII12	VII13	VII14	VII15	VII16	VII17	VII18	VII1
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									
										1									
										2									
										3									
										4									

*** In-kind Payment Codes:** **** Meal Codes:**

1=tef 2=maize 3=wheat 4=barley 5=sorghum 1=lunch 2=dinner3=local drink

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Table XIII. INPUTS USED IN THE TRADITIONAL TEF PLOT ___2___

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit? 1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment: Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
100 Seed Treatment Type_____ Type_____												
200 Seed Variety (ies) _____ _____ _____												
Animal Traction												
10 First Plowing												
11 Second Plowing												
12 Third Plowing												
13 Fourth Plowing												
14 Fifth Plowing												
15 Sixth Plowing												
23 Trampling/leveling												
80 Transport to threshing area												

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
81 Transport to storage area												

1. CURRENT SG2000/GOV'T EXT. PROGRAM / TEF ZON_____WOR_____FA_____HH_____QTYPE_____ENUM_____

Input	How much was used? (For animals/tractor no.days/hrs)		Did you pay cash or in kind for this input?	How did you get it?	When was it applied? (Copy dates from field worksheet)		How much did it cost?					Did you pay immediately after receiving the input or did you receive credit?
	Qt	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 6=tractor hours 7=tractor ha 20= other (specify)	0 no (skip to the next input) 1 yes (proceed to next column)	1 SG2000/ Gov't extension program 2 Trader/Market 3 Rented (animals/tractor) 4 Own/Saved 20 Other (specify)	Month (1,2,...12)	Week (1,2,3,4)	Cash (Birr)	In-Kind Payment Type 1=tef 2=maize 3=wheat 4=barley 5=sorghum 6==millet 7= pulses 8=oilseeds 20=other (specify)	Qty.	Unit 1=50 kg 2=100 kg 3=kg 4=liter 5=oxen-days 20=other (specify)	Est. Total Value in Birr	1 immediate payment 2 Credit 3 Both (indicate amt. input received on credit)
INPUT	VIII1	VIII2	VIII3	VIII4	VIII5	VIII6	VIII7	VIII8	VIII9	VIII10	VIII11	VIII12
Tractor												
10 First Plowing												
11 Second Plowing												
Other Inputs												
300 DAP Fertilizer												
400 Urea Fertilizer												
500 Herbicide Type/form. _____												
600 Field Insecticide Type/form. _____												
Other _____												

CP5 _____ Did you split the application of urea during the current season?

0 = no
1 = yes

If yes, how did you split it?

CP6 _____ kgs at broadcasting

CP7 _____ kgs as top dressing

APPENDIX 3: FINANCIAL BUDGETS

Table 27. Summary of Farm Level Enterprise Budgets for Maize (West Shoa), by Program Type

Budget Item	MOA/SG	Graduate
n used in calculations[a]	92	57
1. GRAIN YIELD[b](kg/ha)	5554	4803
1.A. January 1998 adjusted yield	5337	4616
1.B. April-May 1998 adjusted yield	4979	4305
1.C. August 1998 adjusted yield	4643	4016
1.D. Aug. 1998, if storage losses decline by 50%	5081	4394
2. EST. FARMGATE PRICE[c] (birr/kg)		
2.A. January 1998	0.69	0.69
2.B. April-May 1998	0.72	0.72
2.F. August 1998	0.89	0.89
3. GROSS REVENUE[d](birr/ha)		
3.A. Jan. Sale	2781.0	2702.4
3.B. Apr.-May Sale[e]	2577.7	2521.0
3.C. Aug. Sale[f]	3010.9	2890.1
3.D. Aug. Sale, if storage losses decline by 50%	3322.0	3159.2
4. PACKAGE COSTS[g] (birr/ha)	657	295
4.A. Seed	136	93
4.B. DAP	260	109
4.C. Urea	260	92
4.D. Herbicide	1	1
4.E. Insecticide	0	0
4.F. Fungicide	0	0
5. INTEREST		
5.A. January 1998[h]	0	15.9
5.B. Apr.-May 1998[i]	0	21.4
5.C. August 1998[j]	0	27.0
6. LABOR		
6.A. Total family/mutual labor days(adult equiv. days/ha)[k]	158	206
6.B. Total wage labor (birr/ha)[l]	123	77
7. ANIMAL TRACTION COST[m] (birr/ha)	93	74
8. HAND TOOLS AND SACKS (birr/ha)	28.7	20.5
8.A. Hand tools[n]	1.6	1.5
8.B. Sacks[o]	27.1	19.0
9. NET INCOME/HA		
9.A. Jan. Sale[p]	2781.0	2702.4
9.B. Apr.-May Sales[q]	2577.7	2521.0
9.C. Aug. Sale[r]	3010.9	2890.1
9.D. Aug. Sale, if storage losses decline by 50%	3322.0	3159.2
9.E. Jan. Sale, 25% Output Price Decline	1860.3	1906.2
9.F. Jan. Sale, 50% Output Price Decline	939.6	1110.0
10. NET INCOME/FAMILY AND MUTUAL LABOR DAY		
10.A. Jan. Sale[s]	17.6	13.1
10.B. Apr.-May Sale[t]	16.3	12.2
10.C. Aug. Sale[u]	19.1	14.0
10.D. Aug. Sale, if storage losses decline by 50%	21.0	15.3
10.E. Jan. Sale, 25% Output Price Decline	11.8	9.3
10.F. Jan. Sale, 50% Output Price Decline	5.9	5.4

[a]No traditional plots from West Shoa were included in the survey.

[b]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during shelling. Assumes maize was harvested in November and storage losses are 1.98% per month, the average of estimates from Abraham et al. 1993. 1.D. scenario assumes that storage insecticide is used and grain losses are halved.

[c]Source: EGTE price monitoring unit and GMRP/MSU/AAU/MOA/SG2000 Survey. Local market prices collected by EGTE are adjusted to farmgate prices using survey data on prices reported by farmers. Prices are average prices for white maize during January 1998, average April-May 1998, and August 1998.

[d]Grain yield* grain price.

[e]Adjusted as follows: if the farmer sold maizein January rather than April-May, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-April/May period from the gross revenue.
[f]Adjusted as follows: if the farmer sold maize in January rather than August, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-August period from the gross revenue.
[g] 4.A.+4.B.+4.C.+4.D.+4.E.+4.F. MOA/SG2000 maize package consists of (quantities/ha) 25 kg seed, 100 kg DAP, 100 kg urea. Mean cost reported by farmers.
[h]Source: GMRP/MSU/AAU/MOA/SG2000 Survey and rate information from MOA/SG2000. MOA program participants pay 10% interest annually. Assumes that period of loan is 10 months.
[i]Period of loan assumed to be 13.5 months.
[j]Period of loan assumed to be 17 months.
[k]Source: GMRP/MSU/AAU/MOA/SG2000 Survey. Includes shelling labor
[l]Valued at cash/in-kind payment rates provided by survey participants.
[m]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot.
[n]Depreciated value of 2 sickles, 2 hoes, and 2 spades. Purchase price, life and salvage value of equipment based on field reports by survey supervisors.
[o]Depreciated value of sacks needed to transport maize marketed in 1997--98 season. Number of sacks is adjusted for grain losses in storage. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and value based on field reports by survey supervisors.
[p]3A - (4 + 5.A. + 6.B. + 7 + 8A + 8B)
[q]3B - (4 + 5.B. + 6.B. + 7 + 8A + 8C)
[r]3C - (4 + 5.C. + 6.B. + 7 + 8A + 8D)
[s]9A/6A
[t]9B/6A
[u]9C/6A

Table 28. Summary of Farm Level Enterprise Budgets for Maize (Jimma), by Program Type

Budget Item	MOA/SG	Traditional	Graduate
n used in calculations	69	47	39
1. GRAIN YIELD[a](kg/ha)	5508	2814	6781
1.A. January 1998 adjusted yield	5293	2704	6516
1.B. April-May 1998 adjusted yield	4937	2522	6078
1.C. August 1998 adjusted yield	4605	2353	5669
1.D. Aug. 1998, if storage losses decline by 50%	5039	2574	6203
2. EST. FARMGATE PRICE[b] (birr/kg)			
2.A. January 1998	0.54	0.54	0.54
2.B. April-May 1998	0.65	0.65	0.65
2.F. August 1998	0.93	0.93	0.93
3. GROSS REVENUE (birr/ha)			
3.A. Jan. Sale	2042.1	1029.1	2543.2
3.B. Apr.-May Sale[d]	2300.8	1160.3	2848.3
3.C. Aug. Sale[e]	3257.4	1648.0	4012.6
3.D. Aug. Sale, if storage losses decline by 50%	3577.2	1811.0	4405.7
4. PACKAGE COSTS[f] (birr/ha)	642	280	606
4.A. Seed	129	40	122
4.B. DAP	263	239	249
4.C. Urea	248	0	235
4.D. Herbicide	0.4	0	0
4.E. Insecticide	0	0	0.4
4.F. Fungicide	1.6	.8	0
5. INTEREST			
5.A. January 1998[g]	0	2.7	38.3
5.B. Apr.-May 1998[h]	0	3.7	51.7
5.C. August 1998[i]	0	4.6	65.1
6. LABOR			
6.A. Total family/mutual labor days(adult equiv. days/ha)[j]	135	92	140
6.B. Total wage labor (birr/ha)[k]	62	36	71
7. ANIMAL TRACTION COST[l] (birr/ha)	98	112	213
8. HAND TOOLS AND SACKS (birr/ha)	39.2	13.5	77.7
8.A. Hand tools[m]	2.8	2.9	5.5
8.B. Sacks[n]	36.3	10.5	72.2
9. NET INCOME/HA			
9.A. Jan. Sale[o]	2042.1	1029.1	2543.2
9.B. Apr.-May Sales[p]	2300.8	1160.3	2848.3
9.C. Aug. Sale[q]	3257.4	1648.0	4012.6
9.D. Aug. Sale, if storage losses decline by 50%	3577.2	1811.0	4405.7
9.E. Jan. Sale, 25% Output Price Decline	1321.3	660.8	1655.8
9.F. Jan. Sale, 50% Output Price Decline	600.5	292.5	768.4
10. NET INCOME/FAMILY AND MUTUAL LABOR DAY			
10.A. Jan. Sale[r]	15.1	11.2	18.2
10.B. Apr.-May Sale[s]	17.0	12.6	20.3
10.C. Aug. Sale[t]	24.1	17.9	28.7
10.D. Aug. Sale, if storage losses decline by 50%	26.5	19.7	31.5
10.E. Jan. Sale, 25% Output Price Decline	9.8	7.2	11.8
10.F. Jan. Sale, 50% Output Price Decline	4.4	3.2	5.5

[a]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during shelling. Assumes maize was harvested in November and storage losses are 1.98% per month, the average of estimates from Abraham et al. 1993.

[b]Source: EGTE price monitoring unit and GMRP/MSU/AAU/MOA/SG2000 Survey. Local market prices collected by EGTE are adjusted to farmgate prices using survey data on prices reported by farmers. Prices are average prices for white maize during January 1998, average April-May 1998, and August 1998.

[c]Grain yield* grain price.

[d]Adjusted as follows: if the farmer sold maize in January rather than April-May, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by

deducting the compounded earnings druing the February-April/May period from the gross revenue.

[e]Adjusted as follows: if the farmer sold maize in January rather than August, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-August period from the gross revenue.

[f] 4.A.+4.B.+4.C.+4.D.+4.E.+4.F. MOA/SG2000 maize package consists of (quantities/ha) 25 kg seed, 100 kg DAP, 100 kg urea. Mean cost reported by farmers.

[g]Source: GMRP/MSU/AAU/MOA/SG2000 Survey and rate information from MOA/SG2000. MOA program participants pay 10% interest annually. Assumes that period of loan is 10 months.

[h]Period of loan assumed to be 13.5 months.

[i]Period of loan assumed to be 17 months.

[j]Source: GMRP/MSU/AAU/MOA/SG2000 Survey. Includes shelling labor.

[k]Valued at cash/in-kind payment rates provided by survey participants.

[l]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot.

[m]Depreciated value of 2 sickles, 2 hoes, and 2 spades. Purchase price, life and salvage value of equipment based on field reports by survey supervisors.

[n]Depreciated value of sacks needed to transport maize marketed in 1997--98 season. Number of sacks is adjusted for grain losses in storage. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and value based on field reports by survey supervisors.

[o]3A - (4 + 5.A. + 6.B. + 7 + 8A + 8B)

[p]3B - (4 + 5.B. + 6.B. + 7 + 8A + 8C)

[q]3C - (4 + 5.C. + 6.B. + 7 + 8A + 8D)

[r]9A/6A

[s]9B/6A

[t]9C/6A

Table 29. Summary of Farm Level Enterprise Budget for Maize (West Shoa), by Technology Type

Budget Item	Local seed, no fertilizer	Improved seed + DAP+urea< recommended rate	Improved seed + DAP + urea >= recommended rate
n used in calculations[a]	33	45	68
1. GRAIN YIELD[b](kg/ha)	3858	5784	5685
1.A. January 1998 adjusted yield	3707	5558	5463
1.B. April-May 1998 adjusted yield	3458	5185	5096
1.C. August 1998 adjusted yield	3225	4835	4752
1.D. Aug. 1998, if storage losses decline by 50%	3547	5318	5226
2. EST. FARMGATE PRICE[c] (birr/kg)			
2.A. January 1998	0.69	0.69	0.69
2.B. April-May 1998	0.72	0.72	0.72
2.F. August 1998	0.89	0.89	0.89
3. GROSS REVENUE[d]			
3.A. Jan. Sale	2558.2	3835.3	3769.6
3.B. Apr.-May Sale[e]	2425.2	3636.4	3574.0
3.C. Aug. Sale[f]	2717.3	4074.7	4004.7
3.D. Aug. Sale, if storage losses decline by 50%	3000.5	4498.7	4420.9
4. PACKAGE COSTS[g] (birr/ha)	71	533	730
4.A. Seed	71	110	151
4.B. DAP	0	210	289
4.C. Urea	0	210	289
4.D. Herbicide	0	3	1
4.E. Insecticide	0	0	0
4.F. Fungicide	0	0	0
5. INTEREST			
5.A. January 1998[h]	0	9.0	7.0
5.B. Apr.-May 1998[i]	0	12.0	10.0
5.C. August 1998[j]	0	15	13
6. LABOR			
6.A. Total family/mutual labor days(adult equiv. days/ha)[k]	204	158	172
6.B. Total wage labor (birr/ha)[l]	92	60	146
7. ANIMAL TRACTION COST[m] (birr/ha)	63	91	96
8. HAND TOOLS AND SACKS (birr/ha)			
8.A. Hand tools[n]	1.3	1.6	1.7
8.B. Sacks--January[o]	14.8	38.4	30.0
8.C. Sacks--Apr.-May	13.8	35.9	27.9
8.D. Sacks--August	12.8	33.4	26.1
9. NET INCOME/HA			
9.A. Jan. Sale[p]	2316.1	3102.3	2758.9
9.B. Apr.-May Sales[q]	2184.1	2902.9	2562.4
9.C. Aug. Sale[r]	2477.2	3340.7	2991.9
9.D. Aug. Sale, if storage losses decline by 50%	2759.2	3761.4	3405.5
9.E. Jan. Sale, 25% Output Price Decline	1676.5	2143.4	1816.5
9.F. Jan. Sale, 50% Output Price Decline	1037.0	1184.6	874.1
10. NET INCOME/FAMILY AND MUTUAL LABOR DAY			
10.A. Jan. Sale[s]	11.4	19.6	16.0
10.B. Apr.-May Sale[t]	10.7	18.4	14.9
10.C. Aug. Sale[u]	12.1	21.1	17.4
10.D. Aug. Sale, if storage losses decline by 50%	13.5	23.8	19.8
10.E. Jan. Sale, 25% Output Price Decline	8.2	13.6	10.6
10.F. Jan. Sale, 50% Output Price Decline	5.1	7.5	5.1

[a]Two households surveyed are excluded from this analysis because they represent unique technology types: local seed+DAP+urea; improved

seed+DAP.

[b]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during shelling. Assumes maize was harvested in November and storage losses are 1.98% per month, the average of estimates from Abraham et al. 1993. 1.D. scenario assumes that storage insecticide is used and grain losses are halved.

[c]Source: EGTE price monitoring unit and GMRP/MSU/AAU/MOA/SG2000 Survey. Local market prices collected by EGTE are adjusted to farmgate prices using survey data on prices reported by farmers. Prices are average prices for white maize during January 1998, average April-May 1998, and August 1998.

[d]Grain yield* grain price.

[e]Adjusted as follows: if the farmer sold maizein January rather than April-May, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-April/May period from the gross revenue.

[f]Adjusted as follows: if the farmer sold maize in January rather than August, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-August period from the gross revenue.

[g] 4.A.+4.B.+4.C.+4.D.+4.E.+4.F. MOA/SG2000 maize package consists of (quantities/ha) 25 kg seed, 100 kg DAP, 100 kg urea. Mean cost reported by farmers.

[h]Source: GMRP/MSU/AAU/MOA/SG2000 Survey and rate information from MOA/SG2000. MOA program participants pay 10% interest annually. Assumes that period of loan is 10 months.

[i]Period of loan assumed to be 13.5 months.

[j]Period of loan assumed to be 17 months.

[k]Source: GMRP/MSU/AAU/MOA/SG2000 Survey. Includes shelling labor

[l]Valued at cash/in-kind payment rates provided by survey participants.

[m]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot.

[n]Depreciated value of 2 sickles, 2 hoes, and 2 spades. Purchase price, life and salvage value of equipment based on field reports by survey supervisors.

[o]Depreciated value of sacks needed to transport maize marketed in 1997--98 season. Number of sacks is adjusted for grain losses in storage. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and salvage value based on field reports by survey supervisors.

[p]3A - (4 + 5.A. + 6.B. + 7 + 8A + 8B)

[q]3B - (4 + 5.B. + 6.B. + 7 + 8A + 8C)

[r]3C - (4 + 5.C. + 6.B. + 7 + 8A + 8D)

[s]9A/6A

[t]9B/6A

[u]9C/6A

Table 30. Summary of Farm Level Enterprise Budget for Maize (Jimma), by Technology Type

Budget Item	Local seed + DAP	Improved seed + DAP+urea< rec. rate	Improved seed + DAP + urea >= rec. rate
n used in calculations	43	58	50
1. GRAIN YIELD[a](kg/ha)	2905	6007	5922
1.A. January 1998 adjusted yield	2791	5773	5690
1.B. April-May 1998 adjusted yield	2604	5384	5308
1.C. August 1998 adjusted yield	2428	5022	4950
1.D. Aug. 1998, if storage losses decline by 50%	2671	5523	5444
2. EST. FARMGATE PRICE[b] (birr/kg)			
2.A. January 1998	0.54	0.54	0.54
2.B. April-May 1998	0.65	0.65	0.65
2.F. August 1998	0.93	0.93	0.93
3. GROSS REVENUE[c]			
3.A. Jan. Sale	1507.1	3117.2	3072.6
3.B. Apr.-May Sale[d]	1654.5	3421.6	3372.6
3.C. Aug. Sale[e]	2168.8	4484.0	4420.6
3.D. Aug. Sale, if storage losses decline by 50%	2392.0	4946.0	4875.2
4. PACKAGE COSTS[f] (birr/ha)	301	549	721
4.A. Seed	39	111	145
4.B. DAP	261	225	296
4.C. Urea	0	212	278
4.D. Herbicide	0	0	1
4.E. Insecticide	0	0	0
4.F. Fungicide	1	1	1
5. INTEREST			
5.A. January 1998[g]	3	14	13
5.B. Apr.-May 1998[h]	4.0	19.0	18.0
5.C. August 1998[i]	5.0	24.0	23.0
6. LABOR			
6.A. Total family/mutual labor days(adult equiv. days/ha)[j]	93	115	162
6.B. Total wage labor (birr/ha)[k]	36	79	50
7. ANIMAL TRACTION COST[l] (birr/ha)	98	144	134
8. HAND TOOLS AND SACKS (birr/ha)	15.4	70.4	47.9
8.A. Hand tools[m]	2.9	3.8	3.7
8.B. Sacks--January[n]	12.5	66.6	44.2
8.C. Sacks--Apr.-May	11.6	62.1	41.2
8.D. Sacks--August	10.8	57.9	38.4
9. NET INCOME/HA			
9.A. Jan. Sale[o]	1053.7	2260.8	2106.7
9.B. Apr.-May Sales[p]	1201.0	2564.7	2404.7
9.C. Aug. Sale[q]	1715.1	3626.3	3450.5
9.D. Aug. Sale, if storage losses decline by 50%	1937.2	4082.6	3901.3
9.E. Jan. Sale, 25% Output Price Decline	990.9	2130.9	1978.7
9.F. Jan. Sale, 50% Output Price Decline	509.5	1135.2	997.2
10. NET INCOME/FAMILY AND MUTUAL LABOR DAY			
10.A. Jan. Sale[r]	11.3	19.7	13.0
10.B. Apr.-May Sale[s]	12.9	22.3	14.8
10.C. Aug. Sale[t]	18.4	31.5	21.3
10.D. Aug. Sale, if storage losses decline by 50%	20.8	35.5	24.1
10.E. Jan. Sale, 25% Output Price Decline	10.7	18.5	12.2
10.F. Jan. Sale, 50% Output Price Decline	5.5	9.9	6.2

[a]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during shelling. Assumes maize was harvested in November and storage losses are 1.98% per month, the average of estimates from Abraham et al. 1993.
[b]Source: EGTE price monitoring unit and GMRP/MSU/AAU/MOA/SG2000 Survey. Local market prices collected by EGTE are adjusted to

farmgate prices using survey data on prices reported by farmers. Prices are average prices for white maize during January 1998, average April-May 1998, and August 1998.

[c]Grain yield* grain price.

[d]Adjusted as follows: if the farmer sold maize in January rather than April-May, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings during the February-April/May period from the gross revenue.

[e]Adjusted as follows: if the farmer sold maize in January rather than August, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings during the February-August period from the gross revenue.

[f] 4.A.+4.B.+4.C.+4.D.+4.E.+4.F. MOA/SG2000 maize package consists of (quantities/ha) 25 kg seed, 100 kg DAP, 100 kg urea. Mean cost reported by farmers.

[g]Source: GMRP/MSU/AAU/MOA/SG2000 Survey and rate information from MOA/SG2000. MOA program participants pay 10% interest annually. Assumes that period of loan is 10 months.

[h]Period of loan assumed to be 13.5 months.

[i]Period of loan assumed to be 17 months.

[j]Source: GMRP/MSU/AAU/MOA/SG2000 Survey. Includes shelling labor.

[k]Valued at cash/in-kind payment rates provided by survey participants.

[l]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot.

[m]Depreciated value of 2 sickles, 2 hoes, and 2 spades. Purchase price, life and salvage value of equipment based on field reports by survey supervisors.

[n]Depreciated value of sacks needed to transport maize marketed in 1997--98 season. Number of sacks is adjusted for grain losses in storage. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and salvage value based on field reports by survey supervisors.

[o]3A - (4 + 5.A. + 6.B. + 7 + 8A + 8B)

[p]3B - (4 + 5.B. + 6.B. + 7 + 8A + 8C)

[q]3C - (4 + 5.C. + 6.B. + 7 + 8A + 8D)

[r]9A/6A

[s]9B/6A

[t]9C/6A

Table 31. Summary of Farm Level Enterprise Budget for Tef (East Shoa), by Program Type

Budget Item	NEP Program	Traditional	Graduate
n used in calculations	60	60	60
1. YIELD[a](kg/ha)			
1.A. Grain Yield	1389	1364	1455
1.B. Straw Yield	2180	2025	2071
2. EST. FARMGATE PRICE[b] (birr/kg)			
2.A. January 1998: Grain	2.04	2.04	2.04
2.B. January 1998: Straw	.11	.11	.11
2.C. April-May 1998: Grain	2.11	2.11	2.11
2.D. April-May 1998: Straw	.16	.16	.16
2.E. August 1998: Grain	2.51	2.51	2.51
2.F. August 1998: Straw	.23	.23	.23
3. GROSS REVENUE[c]			
3.A. Jan. Sale	1903.6	2090.5	2193.4
3.B. Apr.-May Sale[d]	2008.9	2192.6	2299.5
3.C. Aug. Sale[e]	2602.7	2771.9	2912.5
4. PACKAGE COSTS[f] (birr/ha)	655	540	571
4.A. Seed	150	167	190
4.B. DAP	251	214	227
4.C. Urea	226	141	129
4.D. Herbicide	28	18	25
4.E. Insecticide	0	0	0
4.F. Fungicide	0	0	0
5. INTEREST			
5.A. January 1998[g]	28.0	20.0	19.7
5.B. Apr.-May 1998[h]	41.9	30.1	29.5
5.C. August 1998[i]	55.9	40.1	39.4
6. LABOR			
6.A. Total family/mutual labor days(adult equiv. days/ha)[j]	64	58	77
6.B. Total wage labor (birr/ha)[k]	192	142	184
7. ANIMAL TRACTION COST[l] (birr/ha)	291	210	224
8. HAND TOOLS AND SACKS[m] (birr/ha)	6.5	4.9	5.7
8.A. Hand tools[n] (birr)	2.2	1.6	1.6
8.B. Sacks[o] (birr)	4.3	3.3	4.1
9. NET INCOME/HA			
9.A. Jan. Sale[p]	1903.6	2090.5	2193.4
9.B. Apr.-May Sale[q]	2008.9	2192.6	2299.5
9.C. Aug. Sale[r]	2602.7	2771.9	2912.5
9.D. Jan. Sale, 25% Output Price Decline	1134.6	1338.6	1394.0
9.E. Jan. Sale, 50% Output Price Decline	365.6	586.8	594.5
10. NET INCOME/FAMILY AND MUTUAL LABOR DAY			
10.A. Jan. Sale[s]	29.7	36.0	28.5
10.B. Apr.-May Sale[t]	31.4	37.8	29.9
10.C. Aug. Sale[u]	40.7	47.8	37.8
10.D. Jan. Sale, 25% Output Price Decline	17.7	23.1	18.1
10.E. Jan. Sale, 50% Output Price Decline	5.7	10.1	7.7

[a]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during threshing.

[b]Source: EGTE price monitoring unit and GMRP/MSU/AAU/MOA/SG2000 Survey. Local market prices collected by EGTE are adjusted to farmgate prices using survey data on prices reported by farmers. Prices are average prices for white teff during January 1998, average April-May 1998, and August 1998.

[c](Grain yield* grain price)+(straw yield*straw price)

[d]Adjusted as follows: if the farmer sold tef in January rather than April-May, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings durng the February-April/May period from the gross revenue.

[e]**Adjusted as follows: if the farmer sold tef in January rather than August, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings during the February-August period from the gross revenue.**
[f] **4.A.+4.B.+4.C.+4.D.+4.E.+4.F. MOA tef package consists of (quantities/ha) 35 kg seed, 100 kg DAP, 100 kg urea, U-46 herbicide. Mean cost reported by farmers.**
[g]**Source: GMRP/MSU/AAU/MOA/SG2000 Survey and rate information from MOA/SG2000. MOA program participants pay 10% interest annually. Assumes that period of loan is 7 months.**
[h]**Period of loan assumed to be 10.5 months.**
[i]**Period of loan assumed to be 14 months.**
[j]**Source: GMRP/MSU/AAU/MOA/SG2000 Survey.**
[k]**Valued at cash/in-kind payment rates provided by survey participants.**
[l]**Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot.**
[m]**Sum of hand tool and sack costs.**
[n]**Depreciated value of 2 sickles, 2 hoes, and 2 spades. Purchase price, life and salvage value of equipment based on field reports by survey supervisors.**
[o]**Depreciated value of sacks needed to transport tef marketed in 1997--98 season. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price and life based on field reports by survey supervisors.**
[p]**3 - (4 + 5.A. + 6.B. + 7 + 8)**
[q]**3 - (4 + 5.B. + 6.B. + 7 + 8)**
[r]**3 - (4 + 5.C. + 6.B. + 7 + 8)**
[s]**9A/6A**
[t]**9B/6A**
[u]**9C/6A**

Table 32. Summary of Farm Level Enterprise Budget for Tef (East Shoa), by Technology Type

Budget Item	Program seed, recommended quantities DAP, urea	Saved (imp.) seed, near recommended quantities DAP, urea	Saved (imp.) seed, farmer choice DAP/urea
n used in calculations	35	63	69
1. YIELD[a](kg/ha)			
1.A. Grain Yield	1082	1523	1482
1.B. Straw Yield	2103	2144	2051
2. EST. FARMGATE PRICE[b] (birr/kg)			
2.A. January 1998: Grain	2.04	2.04	2.04
2.B. January 1998: Straw	.11	.11	.11
2.C. April-May 1998: Grain	2.11	2.11	2.11
2.D. April-May 1998: Straw	.16	.16	.16
2.E. August 1998: Grain	2.51	2.51	2.51
2.F. August 1998: Straw	.23	.23	.23
3. GROSS REVENUE[c]			
3.A. Jan. Sale	2442.4	3344.6	3250.5
3.B. Apr.-May Sale[d]	2558.1	3472.2	3373.2
3.C. Aug. Sale[e]	3054	4116	3997.2
4. PACKAGE COSTS[f] (birr/ha)	659	643	536
4.A. Seed	146	177	172
4.B. DAP	254	231	235
4.C. Urea	224	213	108
4.D. Herbicide	35	22	21
4.E. Insecticide	0	0	0
4.F. Fungicide	0	0	0
5. INTEREST			
5.A. January 1998[g]	31.0	23.5	19.2
5.B. Apr.-May 1998[h]	46.5	35.3	28.8
5.C. August 1998[i]	62	47.1	38.4
6. LABOR			
6.A. Total family/mutual labor days(adult equiv. days/ha)[j]	68	67	66
6.B. Total wage labor (birr/ha)[k]	141	227	154
7. ANIMAL TRACTION COST[l] (birr/ha)	273	251	228
8. HAND TOOLS AND SACKS[m] (birr/ha)	7.0	8.0	7.3
8.A. Hand tools[n] (birr)	2.1	1.8	1.7
8.B. Sacks[o] (birr)	4.9	6.2	5.6
9. NET INCOME/HA			
9.A. Jan. Sale[p]	1331.4	2192.1	2306.0
9.B. Apr.-May Sale[q]	1431.6	2385.0	2494.0
9.C. Aug. Sale[r]	1912.0	3139.7	3227.8
9.D. Jan. Sale, 25% Output Price Decline	721.8	1356.4	1493.8
9.E. Jan. Sale, 50% Output Price Decline	112.1	520.7	681.6
10. NET INCOME/FAMILY AND MUTUAL LABOR DAY			
10.A. Jan. Sale[s]	19.6	32.7	34.9
10.B. Apr.-May Sale[t]	21.1	35.6	37.8
10.C. Aug. Sale[u]	28.1	46.9	48.9
10.D. Jan. Sale, 25% Output Price Decline	10.6	20.2	22.6
10.E. Jan. Sale, 50% Output Price Decline	1.6	7.8	10.3

[a]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during threshing.

[b]Source: EGTE price monitoring unit and GMRP/MSU/AAU/MOA/SG2000 Survey. Local market prices collected by EGTE are adjusted to farmgate prices using survey data on prices reported by farmers. Prices are average prices for white teff during January 1998, average April-May 1998, and August 1998.

[c](Grain yield* grain price)+(straw yield*straw price)

[d]Adjusted as follows: if the farmer sold tef in January rather than April-May, it is assumed that earnings from the January sale would have

been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-April/May period from the gross revenue.

[e]Adjusted as follows: if the farmer sold tef in January rather than August, it is assumed that earnings from the January sale would have been reinvested and earned the same rate of interest as the government program loan (10%/year). The adjusted gross revenue is calculated by deducting the compounded earnings druing the February-August period from the gross revenue.

[f] 4.A.+4.B.+4.C.+4.D.+4.E.+4.F. MOA tef package consists of (quantities/ha) 35 kg seed, 100 kg DAP, 100 kg urea, U-46 herbicide. Mean cost reported by farmers.

[g]Source: GMRP/MSU/AAU/MOA/SG2000 Survey and rate information from MOA/SG2000. MOA program participants pay 10% interest annually. Assumes that period of loan is 7 months.

[h]Period of loan assumed to be 10.5 months.

[i]Period of loan assumed to be 14 months.

[j]Source: GMRP/MSU/AAU/MOA/SG2000 Survey.

[k]Valued at cash/in-kind payment rates provided by survey participants.

[l]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot.

[m]Sum of hand tool and sack costs.

[n]Depreciated value of 2 sickles, 2 hoes, and 2 spades. Purchase price, life and salvage value of equipment based on field reports by survey supervisors.

[o]Depreciated value of sacks needed to transport tef marketed in 1997--98 season. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and salvage value based on field reports by survey supervisors.

[p]3 - (4 + 5.A. + 6.B. + 7 + 8)

[q]3 - (4 + 5.B. + 6.B. + 7 + 8)

[r]3 - (4 + 5.C. + 6.B. + 7 + 8)

[s]9A/6A

[t]9B/6A

[u]9C/6A

APPENDIX 4: ECONOMIC BUDGETS

PART 1: SUMMARY OF ECONOMIC BUDGETS FOR MAIZE AND TEFF

Table 33. Summary of Economic Budgets for Maize by Zone, Program Type and Input Level

	JIMMA						WEST SHOA				
	Program Type			Input Level			Program Type		Input Level		
Zone/Budget Item	MOA/ SG	Tradi-tional	Grad-uate	Local seed + DAP	Imp. seed + DAP+ urea < rec. rate	Imp. seed + DAP+ urea >= rec. rate	MOA/ SG	Grad-uate	Local seed, no fertilizer	Imp. seed + DAP+ urea < rec. rate	Imp. seed + DAP+ urea >= rec. rate
n used in calculations	69	47	39	43	58	50	92	57	33	45	68
1. GRAIN YIELD(kg/ha)[a]	5508	2814	6781	2905	6007	5922	5554	4803	3858	5784	5685
2. PRICE (birr/kg)											
Import Parity[b]	1.35	1.35	1.35	1.35	1.35	1.35	1.43	1.43	1.43	1.43	1.43
Hi Export Parity[c]	0.53	0.53	0.53	0.53	0.53	0.53	0.60	0.60	0.60	0.60	0.60
Break-Even Export Parity[d]	0.26	0.26	0.23	0.26	0.23	0.28	0.27	0.22	0.17	0.22	0.30
3. GROSS REVENUE (birr/ha)											
Import Parity	7153	3654	8806	3772	7801	7690	7621	6591	5294	7937	7801
Hi Export Parity Price	2805	1433	3454	1469	3039	2995	3202	2770	2238	3355	3297
4. PACKAGE COSTS (birr/ha)											
Fertilizer, Seed, Pest. (Hi Fert)[e]	783	298	730	321	664	878	803	430	71	647	899
Fertilizer, Seed, Pest. (Lo Fert.)[f]	657	271	611	291	556	735	670	381	71	540	750
5. COST OF CAPITAL (birr/ha)[g]											
Fertilizer, Seed, Pest. (Hi Fert)	118	45	110	48	100	132	120	65	11	97	135
Fertilizer, Seed, Pest. (Lo Fert.)	99	41	92	44	84	110	101	58	11	81	113
6. ANIMAL TRACTION COSTS (birr/ha)[h]	98	112	213	98	144	134	93	74	63	91	96
7. HAND TOOLS AND SACKS (birr/ha)[i]	39	13	78	15	70	48	29	21	16	40	32
8. LABOR (birr/ha)											
Purchased labor[j]	62	36	71	36	79	50	123	77	92	60	146
Value of family and mutual labor[k]	270	184	280	186	230	324	271	353	350	271	295
9. NET INCOME (birr/ha)[l]											
Import Parity Hi Fert Price	5783	2966	7325	3067	6515	6124	6182	5571	4691	6731	6198
Import Parity Lo Fert Price	5929	2998	7462	3102	6638	6289	6334	5628	4691	6853	6370
Import Parity Hi Fert Price incl. Extension,. Credit Costs[m]	4940	n/a	6482	n/a	5672	5281	5339	4728	n/a	5888	5355
Import Parity Lo Fert Price incl. Extension,Credit Costs	5086	n/a	6619	n/a	5795	5446	5491	4785	n/a	6010	5527
Import Parity Hi Fert, 50% Ext., Credit Costs	5361		6903		6093	5702	5760	5150		6310	5777
Import Parity Lo Fert, 50% Ext., Credit Costs	5507		7040		6217	5867	5913	5207		6432	5948
Export Parity Hi Grain and Hi Fert. Prices	1435	745	1972	764	1752	1429	1763	1750	1635	2149	1695
Export Parity Hi Grain and Hi Fert. Prices incl. Extension, Credit Costs	592	n/a	1129	n/a	909	586	920	907	n/a	1306	852

Sources: Survey and secondary data

[a]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during shelling. Assumes maize was harvested in November and storage losses are 1.98% per month, the average of estimates from Abraham et al.1993.

[b]Import parity price. Assumes that in deficit years Ethiopian maize competes with maize imported from the U.S. For calculation of import parity price under different assumptions see Table 35.

[c]Export parity price based on $194 (CIF Mombasa) received by Ethiopia from Kenya in 1997 (T.Jayne, personal communication). This is considerably above world market levels, however. For detailed calculation of export parity price see Table 35.

[d]Assumes the following fertilizer prices: DAP(FOB US Gulf) USD 240; urea (FOB Middle East port) USD 225.. For detailed calculations, see Tables 37 and 38.

[e]Assumes the following fertilizer prices. DAP(FOB US Gulf) USD 240, urea (FOB Middle East port) USD 225. Quantities and costs were based on survey data and interviews with SG/NEP program administrators. Import parity calculations for fertilizer are shown in Tables 37 and 38. The economic price of maize seed was based on the price charged by Pioneer Hi-Bred International Seed Company. Pioneer imports basic seed for hybrid maize from Zimbabwe and multiplies it in Ethiopia. The price for hybrid maize seed charged by Pioneer-Ethiopia seems to cover the full costs of seed production and marketing, unlike the price charged by the Ethiopian Seed Enterprise (ESE), which supplied the MOA/SG program. ESE's production costs are subsidized by the government of Ethiopia. Assumes that the market price of pesticides accutately reflects their economic value.

[f]Assumes the following fertilizer prices: DAP(FOB US Gulf) USD 200, urea (FOB Middle East port) USD 100. Import parity calculations for fertilizer are shown in Tables 37 and 38. Calculation of other costs as detailed in note e.

[g]The economic opportunity cost of cash investments in agricultural production is estimated as 15%, based on the average market in terest rate in non-agricultural sectors (UNDP 1997).

[h]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment

multiplied by percentage of total farm represented by the sample plot. Maintenance and depreciation values based on reports by survey supervisors.

[i]Depreciated value of 2 sickles, 2 hoes, and 2 spades and value of sacks needed to transport maize marketed in 1997/98 season.. Purchase price, life and value based on field reports by survey supervisors. Number of sacks is adjusted for grain losses in storage. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and value based on field reports by survey supervisors.

[j]Valued at cash/in-kind payment rates provided by survey participants.

[k]Family and mutual labor was valued at 0.5 of the median wage rate for each zone, which ranged from 3-6 birr/day.

[l]Gross revenue - (package costs + cost of capital + hand tools and sacks + purchased labor + value of family and mutual labor).

[m]Calculations based on MOA data presented in Gordon, Habtemariam, and Kiflu 1995. Estimated extension and credit costs are 843 birr/ha.

[f]Assumes low fertilizer prices. For detailed calculations, see Tables 37 and 38.

Table 34. Summary of Economic Budgets for Teff by Zone, Program Type and Input Level

	EAST SHOA					
	Program Type			Input Level		
Zone/Budget Item	MOA/SG	Traditional	Graduate	Prog. seed, recommended quantities DAP, urea	Saved (imp) seed, near recommended DAP, urea	Saved (imp) seed,near recommended DAP, 50% urea
n used in calculations	60	60	60	35	63	69
1. YIELD(kg/ha)[a]						
Grain	1389	1364	1455	1082	1523	1482
Straw	2180	2025	2071	2103	2144	2051
2. PRICE (birr/kg)						
Straw[b]	0.11	0.11	0.11	0.11	0.11	0.11
Import Parity[c]	1.95	1.95	1.95	1.95	1.95	1.95
3. GROSS REVENUE (birr/ha)	2962	2895	3078	2354	3220	3129
4. PACKAGE COSTS (birr/ha)						
Fertilizer, Seed, Pest. (Hi Fert)[d]	699	571	617	703	694	570
Fertilizer, Seed, Pest. (Lo Fert.)[e]	576	489	533	581	575	499
5. COST OF CAPITAL (birr/ha)[f]						
Fertilizer, Seed, Pest. (Hi Fert)	105	86	93	105	104	86
Fertilizer, Seed, Pest. (Lo Fert.)	86	73	80	87	86	75
6. ANIMAL TRACTION COSTS (birr/ha)[g]	291	210	224	273	251	228
7. HAND TOOLS AND SACKS (birr/ha)[h]	7	5	6	7	8	7
8. LABOR (birr/ha)						
Purchased labor[i]	192	142	184	141	227	154
Value of family and mutual labor[j]	171	155	205	181	179	176
9. NET INCOME[k] (Birr/ha)						
Import Parity Hi Fert Price	1498	1728	1750	943	1757	1908
Import Parity Lo Fert Price	1640	1822	1846	1084	1894	1990
Import Parity Hi Fert incl. extension, credit costs[l]	655	n/a	907	100	914	1065
Import Parity Lo Fert incl. extension, credit costs	797	n/a	1003	241	1051	1147
Import Parity Hi Fert incl. 50% extension, credit costs	1077		1328	521	1335	1486
Import Parity Lo Fert incl. 50% extension, credit costs	1218		1425	662	1472	1569

Sources: Survey and secondary data

[a]Source: crop cut estimates, GMRP/MSU/AAU/MOA/SG2000 Survey. Assumes no grain or straw lost during threshing or storage.

[c]Import parity price. Since teff is not widely traded on the world market, the import parity price for wheat, a substitute for teff in Ethiopia, is calculated instead. Because there is a significant price difference between teff and wheat in the domestic market, however, a price premium of 40% (reflecting the higher value consumers place on teff over wheat) was added to the wheat price based on price data from the FEWS-European Union Food Security Project. Detailed calculations are presented in Table 36.

[d]Assumes the following fertilizer prices: DAP(FOB US Gulf) USD 240; urea (FOB Middle East port) USD 225.. For detailed calculations, see Tables 37 and 38. Assumes that the market price of seed and pesticides accutately reflects their economic value.

[e]Assumes the following fertilizer prices: DAP(FOB US Gulf) USD 200, urea (FOB Middle East port) USD 100. Quantities and costs were based on survey data and interviews with SG/NEP program administrators. Import parity calculations for fertilizer are shown in Tables 37 and 38.

[f]The economic opportunity cost of cash investments in agricultural production is estimated as 15%, based on the average market in terest rate in non-agricultural sectors (UNDP 1997).

[g]Sum of (a) rental costs reported by survey respondents and (b) for owned/borrowed oxen, maintenance + depreciated value of animals and animal traction equipment multiplied by percentage of total farm represented by the sample plot. Maintenance and depreciation values based on reports by survey supervisors.

[h]Depreciated value of 2 sickles, 2 hoes, and 2 spades and value of sacks needed to transport maize marketed in 1997/98 season.. Purchase price, life and value based on field reports by survey supervisors. Number of sacks is adjusted for grain losses in storage. Since sacks are retained by famers and used for other purposes, cost is apportioned by multiplying depreciated sack value by percentage of total farm represented by sample plot. Purchase price, life, and value based on field reports by survey supervisors.

[i] Valued at cash/in-kind payment rates provided by survey participants.

[j] Family and mutual labor was valued at 0.5 of the median wage rate for each zone, which ranged from 3-6 birr/day.

[k]gross revenue - (package costs + cost of capital + hand tools and sacks + purchased labor + value of family and mutual labor).

[l]Calculations based on MOA data presented in Gordon, Habtemariam, and Kiflu 1995. Estimated extension and credit costs are 843 birr/ha.

PART 2: CALCULATION OF ECONOMIC PRICES FOR MAIZE AND TEFF

Assumptions for Maize and Teff Price Calculations

1. Transport, Handling and Storage Costs, USD[a]

Location	Distance road (km)	Rate/ton/km	Handling costs birr/qt	Storage costs birr/qt
Assab- Addis Ababa	762	0.35	0.5	0.2
Assab-Jimma	1228	0.35	0.5	0.25
Assab-Weliso (km)	998	0.35	0.5	0.2
Assab-Debre Zeit	835	0.35	0.5	0.2
Djibouti-Addis Ababa	951	0.39	0.5	0.2
Djibouti-Jimma	1271	0.39	0.5	0.25
Djibouti-Weliso	1041	0.39	0.5	0.2
Djibouti-Debre Zeit	878	0.39	0.5	0.2
Addis Ababa-Weliso	115	0.5	0.5	
Addis Ababa-Jimma	343	0.5	0.5	
Addis Ababa-Debre Zeit	73	0.5		

2. Exchange rate[b]

Average marginal rate October 1997-August 1998: 6.97 birr = 1 USD
Average parallel rate October 1997-August 1998: 7.15 birr = 1 USD
[a] Source: Kassahun 1998
[b] Source: National Bank of Ethiopia 1998

Table 35. Calculation of Import and Export Parity Prices for Maize

1. Calculation of on-farm import parity prices
(a) Calculation of wholesale price in Addis Ababa at import parity

Item	USD/ton Assab	Djibouti
Yellow maize, FOB Gulf[a]	106.00	106.00
Premium for white maize[b]	10.00	10.00
Freight and insurance, Gulf to Assab/Djibouti[c]	36.06	36.06
C.I.F. Assab/Djibouti	152.06	152.06
Bank Charges @ 1.25% CIF[d]	1.90	1.90
Transit charge[d]	2.61	3.40
Port charges[d]	1.00	1.12
Stevedoring[d]	6.50	6.00
Crainage[d]	2.00	0
Bagging[d]	4.25	4.25
Losses @ 0.5% CIF[d]	0.76	0.76
Administration, overhead[d]	0.15	0.15
Cost of capital@10.5% for 3 months on 100% CIF[d]	3.99	3.99
Procurement cost F.O.T.	175.22	173.63
Procurement margin[e]	2.87	2.87
Distributor Price F.O.T.	178.09	176.50
Transport to Addis Ababa[f]	38.02	52.88
Unloading into store	0.72	0.72
Cost delivered to warehouse	216.83	230.10
Storage -- 1 month	0.29	0.29

Item	USD/ton Assab	Djibouti
Wholesale margin[g]	2.87	2.87
Wholesale price -- Addis Ababa	219.99	233.26

(b) Calculation of price to farmer in Weliso

Item	Assab	Djibouti
Wholesale price -- Addis Ababa	219.99	233.26
Overheads/profit margin of trader[g]	2.87	2.87
Transport from Weliso to Addis Ababa	5.74	5.74
Transport from farm to Weliso[h]	8.55	8.55
Bags[i]	9.79	9.79
Price paid to Weliso farmer	193.04	206.30

(c) Calculation of price to farmer in Jimma

Item	Assab	Djibouti
Wholesale price -- Addis Ababa	219.99	233.26
Overheads/profit margin of trader[g]	2.87	2.87
Transport from Jimma to Addis Ababa	17.12	17.12
Transport from farm to Jimma[h]	9.27	9.27
Bags[i]	8.39	8.39
Price paid to Weliso farmer	182.35	195.61

2. Calculation of economic on-farm prices based on export parity

(a) Maximum Price to Weliso farmers supplying Kenya

Item	USD/ton High Price
CIF Mombasa[j]	194.00
Freight and insurance, Assab-Mombasa[k]	20.00
F.O.B. Assab/Djibouti	174.00
Wholesaler/exporter's margin[l]	5.74
Subtotal	168.26
Transit charge[d]	2.61
Port charges[d]	1.00
Stevedoring[d]	6.50
Crainage[d]	1.00
Losses @ 0.5% CIF[d]	0.87
Port administration, overhead[d]	0.15
Informal trader's margin[e]	2.87
Transport from Weliso to port	50.00
Loading into truck	1.00
Transport from farmgate to Weliso[h]	8.55
Bags	9.79
Price paid to Weliso farmer	84.00

(b) Maximum Price to Jimma farmers supplying Kenya

Item	USD/ton High Price
CIF Mombasa[j]	194.00
Freight and insurance, Assab-Mombasa[k]	20.00
F.O.B. Assab/Djibouti	174.00
Wholesaler/exporter's margin[l]	5.74
Subtotal	168.26
Transit charge[d]	2.61
Port charges[d]	1.00
Stevedoring[d]	6.50
Crainage[d]	1.00
Losses @ 0.5% CIF[d]	0.87
Port administration, overhead[d]	0.15
Informal trader's margin[e]	2.87
Transport from Jimma to port	61.00
Loading into truck	1.00
Transport from farmgate to Jimma[h]	9.27
Bags	8.39
Price paid to Jimma farmer	74.00

[a]Average yellow maize price October 1997-August 1998 F.O.B. U.S. Gulf. This is the time period when imported maize intended to substitute for 1997/98 domestic production would be purchased. Source: FAO/GIEWS Food Outlook No. 1-4. www.fao.org/waicent/faoinfo/economic/giews
[b]Based on Coulter 1995.
[c]IFDC 1993.
[d]Kassahun 1998.
[e]Estimated at 2 birr/qt.
[f]Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[g]Estimated at 2 birr/qt.
[h]Source: survey supervisors' reports. Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[i]Full price for 10-100 kg bags. Data from survey supervisors' reports. Assumes that bags are imported and values them at parallel exchange rate.
[j]1997 price (T.Jayne, personal communication).
[k]Estimated.
[l]Estimated at 4 birr/qt.

Table 36. Calculation of Import Parity Prices for Wheat

1. Calculation of on-farm import parity prices
(a) Calculation of wholesale price in Addis Ababa at import parity

Item	USD/ton Assab	Djibouti
No. 2 hard winter wheat, FOB Gulf[a]	135.40	135.40
Tef premium[b]	54.16	54.16
Freight and insurance, Gulf to Assab/Djibouti[c]	36.35	36.35
C.I.F. Assab/Djibouti	225.91	225.91
Bank Charges @ 1.25% CIF[d]	2.82	2.82
Transit charge[d]	2.61	3.40
Port charges[d]	1.00	1.12

Item	USD/ton Assab	Djibouti
Stevedoring[d]	6.50	6.00
Crainage[d]	2.00	0
Bagging[d]	4.25	4.25
Losses @ 0.5% CIF[d]	1.13	1.13
Administration, overhead[d]	0.15	0.15
Cost of capital@10.5% for 3 months on 100% CIF[d]	5.93	5.93
Procurement cost F.O.T.	252.31	250.72
Procurement margin[e]	2.87	2.87
Distributor Price F.O.T.	255.18	253.59
Transport to Addis Ababa[f]	38.02	52.88
Unloading into store	0.72	0.72
Cost delivered to warehouse	293.92	307.18
Storage -- 1 month	0.29	0.29
Wholesale margin[g]	2.87	2.87
Wholesale price -- Addis Ababa	297.08	310.34

(b) Calculation of price to farmer in Debre Zeit

Item	Assab	Djibouti
Wholesale price -- Addis Ababa	297.08	310.34
Overheads/profit margin of trader[g]	2.87	2.87
Transport from Debre Zeit to Addis Ababa	3.64	3.64
Transport from farm to Debre Zeit[h]	17.11	17.11
Bags[i]	5.59	5.59
Price paid to Debre Zeit farmer	267.86	281.13

[a]Average price October 1997-August 1998 F.O.B. U.S. Gulf. This is the period when imported wheat intended to substitute for 1997/98 domestic production would be purchased. Source: FAO/GIEWS Food Outlook No. 1-4. www.fao.org/waicent/faoinfo/economic/giews
[b]Price premium for tef over wheat is estimated at 40%, based on reviews of 1998 FEWS-EC Food Security Bulletin and the 1985-96 trend (GMRP 1997).
[c]IFDC 1993.
[d]Kassahun 1998.
[e]Estimated at 2 birr/qt.
[f]Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[g]Estimated at 2 birr/qt.
[h]Source: survey supervisors' reports. Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[i]Full price for 10-100 kg bags. Data from survey supervisors' reports. Assumes that bags are imported; they are valued at the parallel exchange rate.
[j]1997 price (T.Jayne, personal communication).
[k]Estimated.
[l]Estimated at 4 birr/qt.

PART 3: CALCULATION OF ECONOMIC PRICES FOR DAP AND UREA FERTILIZERS

Assumptions for Fertilizer Price Calculations

1. Transport, Handling and Storage Costs, USD[a]

Location	Distance road (km)	Rate/ton/km	Handling costs birr/qt	Storage costs birr/qt
Assab- Addis Ababa	762	0.35	0.5	0.2
Assab-Jimma	1228	0.35	0.5	0.25
Assab-Weliso (km)	998	0.35	0.5	0.2
Assab-Debre Zeit	835	0.35	0.5	0.2
Djibouti-Addis Ababa	951	0.39	0.5	0.2
Djibouti-Jimma	1271	0.39	0.5	0.25
Djibouti-Weliso	1041	0.39	0.5	0.2
Djibouti-Debre Zeit	878	0.39	0.5	0.2
Addis Ababa-Weliso	115	0.5	0.5	
Addis Ababa-Jimma	343	0.5	0.5	
Addis Ababa-Debre Zeit	73	0.5		
Nazret-Weliso	213	0.5		
Nazret-Jimma	441	0.5		
Nazret-Debre Zeit	51	0.5		

2. Exchange rate[b]

Average marginal rate November 1996-March 1997: 6.5 birr = 1 USD
Average parallel rate November 1996-March 1997: 7.13 birr = 1 USD

[a] Source: Kassahun 1998
[b] Source: National Bank of Ethiopia 1998. This is the time period when fertilizer was purchased for the 1997 season

Table 37. Calculation of Import Parity Prices for DAP

(a) Calculation of wholesale price in Nazret at import parity

	High Price - USD/ton		Low Price - USD/ton	
Item	Assab	Djibouti	Assab	Djibouti
DAP FOB US Gulf[a]	240.00	240.00	200.00	200.00
Freight and insurance[b]	37.40	37.40	37.00	37.00
C.I.F. Assab/Djibouti	277.40	277.40	237.00	237.00
Bank charges @1.25% CIF[c]	3.47	3.47	2.96	2.96
Transit charges[c]	2.61	3.40	2.61	3.40
Port charges[c]	1.00	1.12	1.00	1.12
Stevedoring[c]	6.50	6.00	6.50	6.00
Crainage[c]	2.00	0.00	2.00	0.00
Equipment in hold[c]	0.27	0.27	0.27	0.27
Bagging[c]	4.25	4.25	4.25	4.25
Losses@ 5% CIF[c]	1.39	1.39	1.19	1.19
Port administration and overhead[c]	0.15	0.15	0.15	0.15
Interest @ 10.5% for 3 mo. 100%[c] CIF[c]	7.28	7.28	6.22	6.22
Procurement cost F.O.T.	306.32	304.73	264.15	262.56
Procurement margin[d]	3.07	3.07	3.07	3.07

Distributor Price F.O.T.	**309.39**	**307.80**	**267.22**	**265.63**
Transport Assab/Djibouti to Nazret[e]	**41.26**	**48.50**	**41.26**	**48.50**
Unloading into store[c]	**0.77**	**0.77**	**0.77**	**0.77**
Cost delivered to warehouse	**351.42**	**357.07**	**309.25**	**314.90**
Storage -- 2 months[c]	**1.08**	**1.08**	**1.08**	**1.08**
Loading into truck[c]	**0.77**	**0.77**	**0.77**	**0.77**
Wholesale/retail margin[d]	**3.07**	**3.07**	**3.07**	**3.07**
Wholesale price -- Nazret	**356.34**	**361.99**	**314.17**	**319.82**

(b) Calculation of price to farmer in Weliso				
Wholesale price -- Nazret	**356.34**	**361.99**	**314.17**	**319.82**
Transport from Nazret to Weliso[e]	**11.21**	**11.21**	**11.21**	**11.21**
Unloading into store[c]	**0.77**	**0.77**	**0.77**	**0.77**
Storage -- 1 month[c]	**0.31**	**0.31**	**0.31**	**0.31**
Transport -- Weliso to farm[f]	**9.02**	**9.02**	**9.02**	**9.02**
Price at Weliso farmgate	**377.65**	**383.30**	**335.48**	**341.13**

(c) Calculation of price to farmer in Jimma				
Wholesale price -- Nazret	**356.34**	**361.99**	**314.17**	**319.82**
Transport from Nazret to Jimma[e]	**23.21**	**23.21**	**23.21**	**23.21**
Unloading into store[c]	**0.77**	**0.77**	**0.77**	**0.77**
Storage -- 1 month[c]	**0.31**	**0.31**	**0.31**	**0.31**
Transport -- Jimma to farm[f]	**9.77**	**9.77**	**9.77**	**9.77**
Price at Jimma farmgate	**390.40**	**396.05**	**348.23**	**353.88**

(b) Calculation of price to farmer in Debre Zeit				
Wholesale price -- Nazret	**356.34**	**361.99**	**314.17**	**319.82**
Transport from Nazret to Debre[e]	**2.68**	**2.68**	**2.68**	**2.68**
Unloading into store[c]	**0.77**	**0.77**	**0.77**	**0.77**
Storage -- 1 month[c]	**0.31**	**0.31**	**0.31**	**0.31**
Transport -- Debre Zeit to farm[f]	**18.04**	**18.04**	**18.04**	**18.04**
Price at Debre Zeit farmgate	**378.14**	**383.79**	**335.98**	**341.62**

[a]Sources: NFIA 1996 (high); World Bank 1995 (low)
[b]IFDC 1993
[c]Kassahun 1998
[d]Estimated at 2 birr/qt.
[e]Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[f]Source: survey supervisors' reports. Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[g]Full price for 10-100 kg bags. Data from survey supervisors' reports. Assumes that bags are imported; they are valued at the parallel exchange rate.

Table 38. Calculation of Import Parity Prices for Urea

(a) Calculation of wholesale price in Nazret at import parity

	High Price - USD/ton		Low Price - USD/ton	
Item	Assab	Djibouti	Assab	Djibouti
Urea FOB Middle East[a]	225.00	225.00	100.00	100.00
Freight and insurance[b]	17.25	17.25	16.00	16.00
C.I.F. Assab/Djibouti	242.25	242.25	116.00	116.00
Bank charges @1.25% CIF[c]	3.03	3.03	1.45	1.45
Transit charges[c]	2.61	3.40	2.61	3.40
Port charges[c]	1.00	1.12	1.00	1.12
Stevedoring[c]	6.50	6.00	6.50	6.00
Crainage[c]	2.00	0.00	2.00	0.00
Equipment in hold[c]	0.00	0.00	0.00	0.00
Bagging[c]	4.25	4.25	4.25	4.25
Losses@ 5% CIF[c]	1.21	1.21	0.58	0.58
Port administration and overhead[c]	0.15	0.15	0.15	0.15
Interest @ 10.5% for 3 mo. 100%[c] CIF[c]	6.36	6.36	3.05	3.05
Procurement cost F.O.T.	269.36	267.77	137.59	136.00
Procurement margin[d]	3.07	3.07	3.07	3.07
Distributor Price F.O.T.	272.43	270.84	140.66	139.07
Transport Assab/Djibouti to Nazret[e]	39.42	46.33	39.42	46.33
Unloading into store[c]	0.77	0.77	0.77	0.77
Cost delivered to warehouse	312.62	317.94	180.84	186.17
Storage -- 2 months[c]	1.08	1.08	1.08	1.08
Loading into truck[c]	0.77	0.77	0.77	0.77
Wholesale/retail margin[d]	3.07	3.07	3.07	3.07
Wholesale price -- Nazret	317.54	322.86	185.76	191.09

(b) Calculation of price to farmer in Weliso

Wholesale price -- Nazret	317.54	322.86	185.76	191.09
Transport from Nazret to Weliso[e]	11.21	11.21	11.21	11.21
Unloading into store[c]	0.77	0.77	0.77	0.77
Storage -- 1 month[c]	0.31	0.31	0.31	0.31
Transport -- Weliso to farm[f]	9.02	9.02	9.02	9.02
Price at Weliso farmgate	338.85	344.17	207.07	212.40

(c) Calculation of price to farmer in Jimma

Wholesale price -- Nazret	317.54	322.86	185.76	191.09
Transport from Nazret to Jimma[e]	23.21	23.21	23.21	23.21
Unloading into store[c]	0.77	0.77	0.77	0.77
Storage -- 1 month[c]	0.31	0.31	0.31	0.31
Transport -- Jimma to farm[f]	9.77	9.77	9.77	9.77
Price at Jimma farmgate	351.60	356.92	219.82	225.15

(b) Calculation of price to farmer in Debre Zeit

Wholesale price -- Nazret	317.54	322.86	185.76	191.09
Transport from Nazret to Debre[e]	2.68	2.68	2.68	2.68
Unloading into store[c]	0.77	0.77	0.77	0.77

Storage -- 1 month[c]	**0.31**	**0.31**	**0.31**	**0.31**
Transport -- Debre Zeit to farm[f]	**18.04**	**18.04**	**18.04**	**18.04**
Price at Debre Zeit farmgate	**339.34**	**344.67**	**207.57**	**212.89**

[a]Sources: NFIA 1996 (high); Stepanek 1999 (low)
[b]IFDC 1993
[c]Kassahun 1998
[d]Estimated at 2 birr/qt.
[e]Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[f]Source: survey supervisors' reports. Assumes that 75% of transport cost is composed of traded goods and valued at the parallel exchange rate.
[g]Full price for 10-100 kg bags. Data from survey supervisors' reports. Assumes that bags are imported; they are valued at the parallel exchange rate.

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