THE PRACTITIONERS' GUIDE TO HEA

Team Leaders' Supplement

TEAM LEADERS' SUPPLEMENT

This chapter is designed for HEA team leaders. The material here is technically advanced, designed to provide detailed guidance on two processes and tools that the team leaders need to become skilled at: the Baseline Storage Spreadsheet; and Outcome Analysis (using the Single Zone Spreadsheet and the Integrated Spreadsheet). A basic introduction to these tools is provided in **Chapters 3** and **4**, however, this chapter contains the information required to actually utilise and become adept at them.

After reading this chapter team leaders should be fully familiar with the layout of the Baseline Storage Spreadsheet; be able to enter baseline data into the Baseline Storage Sheet; know how to protect and lock cells in the spreadsheet; and use the Sheet for analysis and cross-checking.

In addition, he/she will learn the basic steps in the process of outcome analysis starting from pencil and paper example and then using the Single Zone Spreadsheet, and finally the Integrated Spreadsheet. After working his/her way through the calculations and examples provided here, the team leader should be able to easily make his/her way around the Single Zone Spreadsheet and the Integrated Spreadsheet, capable of generating an accurate outcome analysis with either tool, and calculating assistance requirements.

This chapter was written by Mark Lawrence.

List of Boxes

List of Tables

RELATED CD FILES

The CD that accompanies the **Practitioners' Guide** contains the following files relevant to the Team Leaders' Supplement, found in the Team Leaders' Supplement directory:

- **Annex A: Expandability – Calculations and Storage**
- **Annex B: The Baseline Storage Sheet**
  - Guidance on the Baseline Storage Sheet File**s**
- **Annex C: The Integrated Spreadsheet**
  - **Guidance on the Integrated Spreadsheet Files**
  - Som_ex
  - IS-ex

RELATED TRAINING MODULES & SESSIONS

The **HEA Training Guide** provides the following modules and sessions relevant to the Team Leaders' Supplement:

MODULE 2: BASELINE ASSESSMENT

- *Session 16: Storing Baseline Information*

MODULE 3: OUTCOME ANALYSIS

- *Session 1: Introduction to Outcome Analysis*
- *Session 2:Problem Specification and Coping Capacity*
- *Session 3: Introduction to the Single Zone Spreadsheet*
- *Session 4: Assessment of Non-food Needs*
- *Session 5: Linking Outcome Analysis to Response Analysis*
- *Session 6: Response Strategies – Switching Expenditure*
- *Session 7: Response Strategies – Expandability of Food and Cash Income*
- *Session 8: Problem Specification - Key Parameters*
- *Session 9: Problem Specification – Defining an Example Problem*
- *Session 10: The Single Zone Spreadsheet - Running the Example Problem*
- *Session 11: Planning the Response*
- *Session 12: The Integrated Spreadsheet*

MODULE 8: TEAM LEADER TRAINING

INTRODUCTION

The team leader is a critical (perhaps the most critical) person in an HEA baseline assessment. He/she plays a central role in keeping the assessment on track, resolving questions and debates, leading the analysis, and is ultimately responsible for ensuring the quality of the information. In particular, the team leader is responsible for the following tasks:

- Setting the schedule
- Deciding on the team composition
- Reviewing secondary information
- Leading training sessions
- Arranging the initial meetings at district and community level
- Making sure the selection of districts and villages meets the assessment's objectives
- Helping resolve technical questions and debates as they arise
- Helping sort out logistical issues
- Ensuring an appropriate reference year is selected
- Making sure interview forms are customised to take account of local variations
- Reviewing completed interview forms to weed out inconsistencies
- Inputting interview data into the Baseline Storage Sheet
- Leading analysis sessions
- Leading the outcome analysis
- Writing the report

The Team Leaders' Supplement does not aim to address all of the above tasks, many of which will be learned over time and with experience. It does set forth to describe a standard approach for using the Baseline Storage Sheet and for tackling the core steps and calculations involved in the Outcome Analysis, and the Integrated Spreadsheet. These are essential tools for the Team Leaders, and require special training, which is contained in the HEA Trainers Guide, Module 3 (*Outcome Analysis*) and Module 8 (*Team Leaders Training*). This chapter is meant to provide background reading for that training, and to provide a refresher course and reference material for trained Team Leaders.

It has been found that using an example has been the most effective way to train new practitioners in conducting Outcome Analysis. The example used in this chapter comes from work conducted in Somalia, with the Food Security Analysis Unit, using some of the household economy baseline data that has been collected there in recent years and the household economy spreadsheet tools developed for Somalia in September 2005. While the specifics of the baseline data in Somalia may not be fully applicable in southern Africa, the steps in the analysis will be the same regardless of setting.

PART ONE: THE BASELINE STORAGE SHEET

THE BASELINE STORAGE SPREADSHEET

The Baseline Storage Spreadsheet is used to document and cross-check each interview and to facilitate post-field work analysis. It is a simple Excel spreadsheet that enables field teams to enter, check and analyse individual interview data in the field. It is also the basic tool that field teams use to analyse and summarise field data during the interim and final data analysis sessions. It has space to record the results from two levels of interview; those undertaken at community level, and those undertaken at wealth group level.

Individual interview data are processed as follows: The field interviewer completes his/her own calculations of the results by pencil and paper. This is done very rapidly at the time of the interview itself (so that interviewers can keep track of progress during the interview) and in more detail in the evening after the interview. This encourages the interviewer to re-examine the results and to identify any questions for clarification and follow-up the next day. The calculations also form the basis of a cross-check at the next stage – data entry. Data entry is the responsibility of the team leader, who enters the detailed data from that day's interviews each evening. The Baseline Storage Sheet automatically completes the calculation of the results (i.e. total food access, total cash income, total expenditure) for immediate comparison with the pencil-and-paper calculations of the interviewer. This checks both the calculations of the interviewer and the data entry of the team leader.

The Baseline Storage Sheet can help increase the accuracy and integrity of the field information by performing a number of calculations that form the basis of key household economy cross-checks:

- calculation of total food access. If this is very much below 100% of minimum food energy needs, and people clearly did not starve in the reference year, then more questions need to be asked and clarification obtained.
- calculation and comparison of total cash income and expenditure. If these are very different, then further follow-up is required to resolve the apparent inconsistency.
- calculation of rates of off-take for each type of livestock (i.e. the percentage of the herd sold and slaughtered in the reference year). This can be compared with a set of reference values; again any major deviation signals the need for further follow-up in the field.
- a cross-check on labour payments, which determines whether the amount of money reportedly earned by poorer wealth groups roughly balances with the amount that the better-off report paying for labour.
- a cross-check on agricultural productivity. This compares the production per unit area obtained by different wealth groups, to check that trends are consistent across wealth groups and are consistent with reported rates of input use, etc.

The first three of these checks are useful at the level of the individual interview (and when summarising the overall results for each wealth group). The last two are used during the interim and final analyses to check the consistency of results across wealth groups and for the livelihood zone as a whole.

The first step in using the Baseline Storage Sheet is to enter the data from the individual interviews. Once this is done, the next step is to summarise the results for each wealth group. This is done within the Baseline Storage Sheet, the layout of which facilitates two types of comparison; a) a comparison of individual interview results within each wealth group and b) an analysis of trends across wealth groups. In each case the spreadsheet facilitates the process of identifying outlying results and identifying the central value to be taken as representative of the wealth group as a whole.

Box 1: Data storage and quality control in the field

The baseline storage spreadsheet is a key tool in terms of storing data in the field and maintaining data quality. It:

- encourages active checking and cross-checking of data by the field teams themselves;
- facilitates rapid on-the-spot analysis, so that any inconsistencies or questions can be resolved by the field teams before they leave the survey area;
- minimizes data entry errors, while at the same time speeding up the processing of basic field data,
- provides a permanent record of individual interview results and the analyses completed by the field teams, so that these can be checked by a supervisor at a later date.

The last step in the analysis is a final cross-check of the results by an experienced supervisor who was not a member of the field team. This can be done either in the field (by a roving supervisor) or at a centralized post-field work analysis session.

The Layout of the Baseline Storage Sheet

The Baseline Storage Sheet contains two sheets that you will use in the analysis of individual interview data. These are:

a) the sheet labelled **'WB'**: for the analysis of wealth breakdown data (from Interview Form 3 and the first page of Interview Form 4)
b) the sheet labelled **'Data'**: for the analysis of the wealth group interview results (Interview Form 4)

There are also between one and four additional sheets, depending upon the version of the baseline storage sheet in use. Further details of these sheets are given in **Table 1**.

How the Remainder of this Chapter is Organised

The next section of this chapter deals with 'Protecting the Spreadsheet and Locking Cells' to prevent the deletion of any of the spreadsheet formulae in error.

After this there are two further sections, one dealing with sheet 'WB' and the next with the 'Data' sheet. In these sections, the layout of the sheet and data entry into the sheet are described.

This is followed by a section on data analysis, including various cross-checks on the data. This covers the analysis of data in both the 'WB' and 'Data' sheets, since the same principles apply to the analysis of both sets of data.

Table 1. Baseline Storage Sheet contents	
Guide	Contains hyperlinks to different sections of the spreadsheet. Can be used to 'tour' the spreadsheet.
WB	Space to enter and analyse data for the wealth breakdown (% households in each wealth group, household size, landholding, livestock holding etc.). Both the results from the community interview and from **page 1** of the wealth group interview format are entered here. Analysing these data is the first step in the analysis process.
Data	Space to enter and analysis individual interview data on food, cash income and expenditure for different wealth groups
Summ	Space to finalise and summarise data from the 'Data' sheet. This sheet is used to prepare the baseline data for entry into the single zone and integrated spreadsheets (see Chapter 4 on Outcome Analysis). THIS SHEET IS NOT USED DURING THE FIELDWORK OR POST-FIELDWORK ANALYSIS AND SHOULD BE PASSWORD-PROTECTED.
Exp factors	Contains factors used by the 'Summ' sheet to calculate expandability. THIS SHEET IS NOT USED DURING THE FIELDWORK OR POST-FIELDWORK ANALYSIS AND SHOULD BE PASSWORD-PROTECTED.
Methods	Space to enter information on the composition of the field team, dates of fieldwork, details of the reference year, etc.
Note: If the baseline storage sheet you are using includes the sheet 'Exp factors', then – each time you open the sheet - you will be told that the worksheet contains links to another spreadsheet and you will be asked if you want to update these links. You should answer no to this question. These links exist because the data in the 'Exp factors' sheet are read from a separate file called 'expandability factors.xls'.	

Protecting the Spreadsheet and Locking Cells

The Baseline Storage Sheet contains many formulae, and the cells containing these should be locked during routine use to prevent the formulae being deleted or changed by accident. For this reason, you should **ALWAYS WORK WITH THE SHEET PROTECTED** (see **Box 2** for how to protect and unprotect a worksheet). From time to time you may need to unprotect one of the worksheets. For example, you may need to unprotect the sheet:

1) To hide a set of rows that is not relevant, e.g. data on camels in a highland area.
2) To change the format of a cell or set of cells (e.g. to change the number of decimal points displayed, or to change from number to percentage format).

IF YOU UNPROTECT THE WORKSHEET FOR ANY REASON, REMEMBER TO RE-PROTECT IT AGAIN IMMEDIATELY AFTERWARDS. If you do not re-protect the sheet, there is a danger you will delete some of the formulae in the spreadsheet and it will stop working properly.

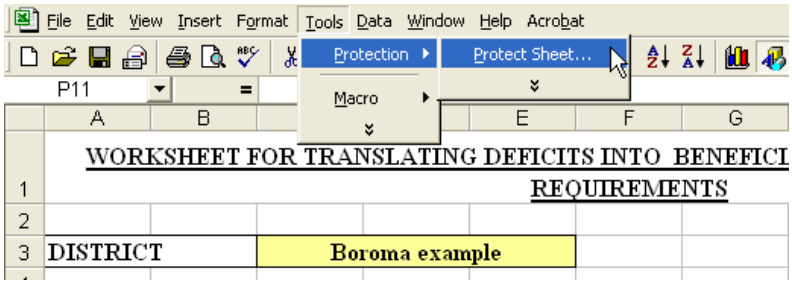
Box 2: How to protect and unprotect a worksheet

How to Protect the Worksheet:

- Select Tools from the menu bar
- Select Protection
- Select Protect Sheet[1]

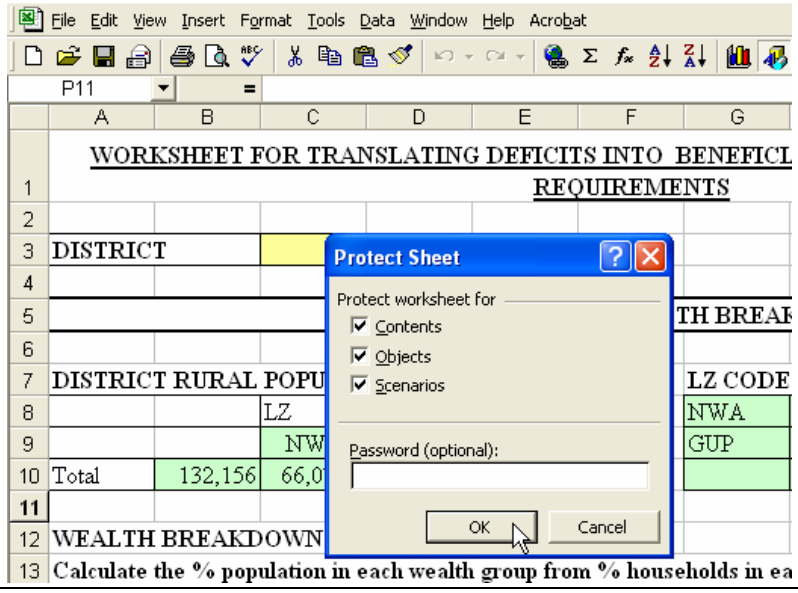
The Protect Sheet dialogue box will appear.

- Click OK to protect the sheet.



How to Unprotect the Worksheet:

- Select Tools from the menu bar
- Select Protection
- Select Unprotect sheet[1]



Note:
[1] If the sheet is unprotected, the Protect Sheet option is displayed, otherwise the Unprotect Sheet option is displayed.

The Wealth Breakdown Sheet (WB)

Layout of Sheet 'WB'

Note: When working through this section of the guide, it is best to have a copy of the Baseline Storage Sheet open on the computer in front of you. This will help in terms of understanding the detailed explanations given here. You will find a blank copy of the Spreadsheet on the CD, in the **Team Leaders' Supplement** directory, in **Annex B**. Also, when reference to an 'Interview Form' is made, this is always to one of the Baseline Assessment Interview Formats found in the Chapter 3, Annex A directory.

The wealth breakdown sheet has a simple tabular format, with the variables to be entered listed one per row on the left. There is then one column for the data from each interview.

Table 2. Wealth Breakdown Sheet contents

Columns	*What the columns contain*
A to B	Titles describing the variable to be entered and for which wealth group
C to J	Wealth breakdown results from the community level interviews (Interview

Table 2. Wealth Breakdown Sheet contents		
Columns	*What the columns contain*	
	Form 3)	
K to R	Data on wealth group characteristics for the very poor, from the wealth group interviews (i.e. the data from **page 1** of Interview Form 4)	
S to Z	As above, for the poor	
AA to AH	As above, for the middle	
AI to AP	As above, for the better-off	
AR	The summary result (or mid-point) for the variable	
AS to AT	The range around the summary result (or mid-point)	
AU	A set of calculations used to cross-check the livestock data (see **page 20**)	
AV	The results of a quick calculation of the summary value (an average of all results *excluding* the lowest and the highest)	
AW	The number of results or observations (including zeros).	
AX	Space for comments or explanations of the analysis	
AZ to BF	This is an area in which additional calculations (e.g. additional cross-checks) can be done.	
Columns	*Shading*	*What the shading means*
A	Light green	These cells are unlocked, so that the titles can be changed to include other wealth characteristics not already included in the list.
C to AP	Grey	These cells are locked to prevent data entry. Only the cells where you should enter data are unlocked.
AR to AU	Light yellow	These cells contain calculations used to cross-check the livestock profile results. These calculations are explained further on **page 20** onwards.

Data entry into sheet 'WB'

The sheet is divided into three sections. On the left (columns C to J) is space to enter data from the wealth breakdown at community level (Interview Form 3). You can enter results for up to 4 wealth groups here (very poor, poor, middle and better-off).

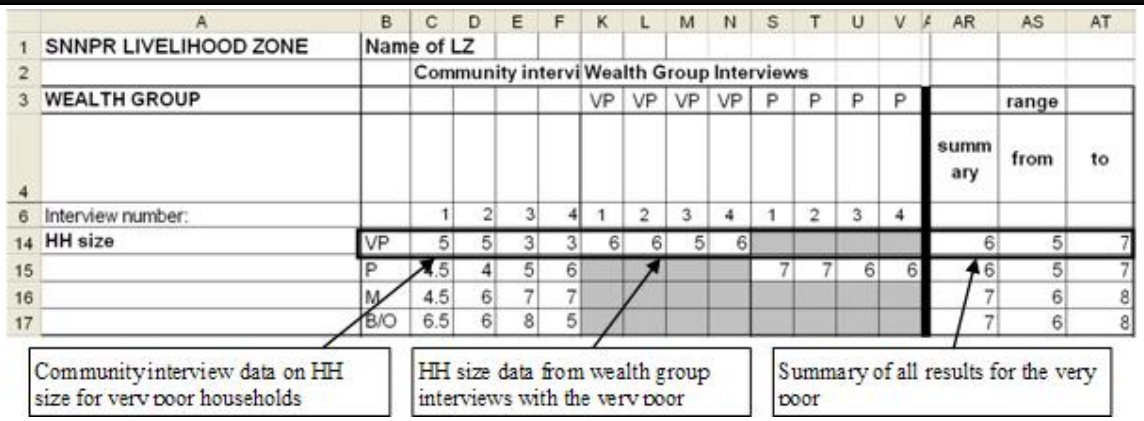
In the middle (columns K to AP) is space to enter data on wealth group characteristics from the wealth group interviews (**page 1** of Interview Form 4). In this case, you will only have data from one wealth group (i.e. very poor, poor, middle or better-off), and you should enter the data in the row that corresponds to that wealth group. This is why many of the cells are shaded grey in this section of the spreadsheet. These are the cells that you should leave empty for that particular wealth group.

Box 3: Dealing with zeros and missing values

- If a value is missing (i.e. no answer recorded on the format) then leave the data entry cell on the spreadsheet blank. Do not enter zeros for missing results.
- Only enter a zero if zero is a valid and genuine result. Zero would be a valid result for sheep ownership, number of milking cows, etc. Zero is not a valid result for household size or for any price.

This applies to data entered into sheet 'Data' as well as sheet 'WB'.

Box 4: Entering and summarising wealth breakdown data on Sheet 'WB'



	A	B	C	D	E	F	K	L	M	N	S	T	U	V	AR	AS	AT
1	SNNPR LIVELIHOOD ZONE	Name of LZ															
2			Community intervi				Wealth Group Interviews										
3	WEALTH GROUP						VP	VP	VP	VP	P	P	P	P		range	
4															summary	from	to
6	Interview number:		1	2	3	4	1	2	3	4	1	2	3	4			
14	HH size	VP	5	5	3	3	6	6	5	6					6	5	7
15		P	4.5	4	5	6					7	7	6	6	6	5	7
16		M	4.5	6	7	7									7	6	8
17		B/O	6.5	6	8	5									7	6	8

Note: In the above diagram a number of columns have been hidden (i.e. interviews 5 to 8 for the community, very poor and poor interviews, and all data for the middle and better-off groups)

In this way, you will find that all data corresponding to a particular wealth group will be entered in a single row, e.g.:

HH size for the very poor will be entered in row 14 (see **Box 4**)

poor	15
middle	16
better-off	17

To the right (columns AR to AT) is space to enter the summary result and range for each wealth group.

Automatic calculations to help summarise the data are carried out in columns AV and AW. The results in the 'calculated' column are average values for each wealth group, excluding the lowest and highest individual results. The number of data values for each wealth group is given in the 'count' column. This should help in deciding whether a particular item is typical or not, e.g. if there are 8 observations for number of sheep owned, then owning sheep can be considered typical for

Box 5: Hiding rows and columns that are not currently in use

- Depending upon the characteristics of the particular livelihood zone, many of the rows in the spreadsheet may not be needed either for data entry or for analysis. In this case, it makes sense to hide the rows that are not being used.
- For example, in a highland farming area, there may be no camels. In this case, the rows dealing with camels, on both sheets 'WB' (rows 34 to 65) and 'Data' (rows 59 to 85), can be hidden.
- For example, in a pastoral area, where no crops are grown, the whole of the crop production section of the spreadsheet (rows 221 to 440 on the 'Data' sheet) can be hidden.
- Note that rows should be hidden, not deleted. Deleting rows will mean that many of the calculations in the spreadsheet will no longer work.
- Columns not currently in use can also be hidden. This is most likely to be useful during data analysis. For example, the results from the middle and better-off can be hidden, while the team completes the analysis of the very poor and poor. Or the comments column can be hidden to make more space on the screen for the actual results.
- Hiding (and unhiding) rows and columns requires that the sheet be unprotected. For instructions on how to hide and unhide rows and columns, see **Box 6**.

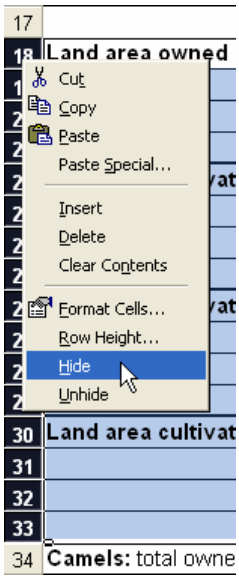
the wealth group. See **Box 7** for further information on the quick calculations. A number of calculations are performed using the summary data in column AR. These are shaded in light yellow. Most of these calculations convert the various livestock variables (e.g. no. births) to a value per 100 animals. This is to facilitate checking of the results against the herd dynamics reference values in the Livelihoods Baseline Field Handbook, see **page 20** onwards).

Box 6: How to hide columns and rows

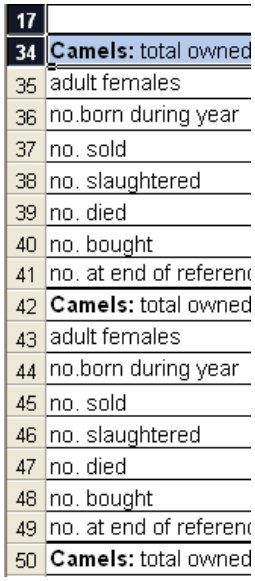
This example illustrates how to hide rows relating to land area on Sheet 'WB'. The teams may want to hide these rows in the case of a pastoral livelihood zone where no crops are grown. The same basic procedure can be followed to hide columns.

Remember that the spreadsheet must be unprotected before columns and rows can be hidden (see **Box 2**).

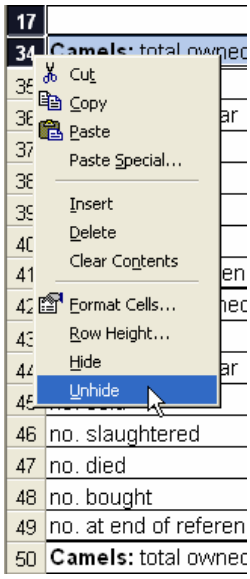
1) Highlight the rows (or columns) to be hidden. In the example, place the cursor over the number indicating row 18, and drag the cursor down to row 33).



2) Right click the mouse button and select hide from the menu. This will hide rows 18 to 33.



3) To unhide the rows again, highlight the area of the sheet containing the hidden rows (rows 17 to 34 in the example).



4) Right click the mouse button and select unhide from the menu. This will unhide rows 18 to 33.

Box 7: Notes on the quick calculations (columns AQ to AX)

- The results in the 'calculated' columns (BB to BE) are average values for each wealth group, excluding the lowest and highest individual results.
- Zeros are included in the average. Therefore be careful to check that zeros are valid.
- Zero is a valid result for no. milking cows, but it is not a valid data point for milk production per day or for the price of maize – in this case, leave the cell blank when entering the data for the individual interview.
- Likewise, for missing data (i.e. no result recorded on the interview form – meaning the question was not asked), leave the cell blank when entering the data for the individual interview.
- The number of data values for each wealth group is given in the 'count' column. This should help in deciding whether a particular item of food, cash income or expenditure is typical for the group as a whole.
- These calculations are intended as an aid to analysis. They are not meant to replace the process of visual screening and evaluation of the individual interview data.

The Food, Income and Expenditure Data Sheet (Data)

Layout of the 'Data' Sheet

The 'Data' sheet contains space to enter data from individual wealth group interviews (columns B to AJ). The variables to be entered are listed in column A, and there is one column for the data from each interview. Summary results for each wealth group are entered at the analysis stage in columns AL to AO.

Table 3. Layout and Contents of the Food, Income and Expenditure Data Sheet

Columns	*What the columns contain*
A	Titles describing the variable to be entered. This includes assets, sources of food, cash income and expenditure
B to I	Results from the interviews with the Very Poor
K to R	Results for the Poor
T to AA	Results for the Middle
AC to AJ	Results for the Better-off
AL to AO	Space to enter summary results for the four wealth groups
AP	Space for comments or explanations of the analysis
AQ to AT	The results of a quick calculation of the summary value for each wealth group (an average of all results *excluding* lowest and highest)
AU to AY	The number of results or observations (including zeros) for each wealth group
AZ to BF	This is an area in which additional calculations (e.g. additional cross-checks) can be done.

Columns	*Shading*	*What the shading means*
A	Light green	These cells are unlocked, so that the titles can be changed to include other variables not already included in the list (see **Table 4**)
B to AO	Light yellow	Calculations of food, income and expenditure, or data read from sheet WB. These cells are locked to prevent accidental erasure of the formulae they contain.
B to AO	Orange	Cross-checks, e.g. of total food access, livestock offtake etc.

Rows	*What the Rows Contain*	
General Results Summary		
10-16	Source of Food and %kcals from each	
17 to 24	Cash income, by category	
25 to 37	Expenditure, by category	
Detailed data on Food, Income and Expenditure		
Rows	Corresponding Section of Data Entry Format (Interview Form 4)	Page no.
38 to 57	Wealth group characteristics (household size, land holding, livestock profile, other assets (carried over from sheet WB)	Page 1
58 to 177	Livestock production (milk, butter, meat)	Page 2
178 to 220	Other income from livestock (sale of livestock, donkey rental, sale of skins etc.)	Page 2
221 to 440	Food and cash from Crop Production	Page 3
441 to 533	Purchase and exchange	Page 4
534 to 555	Payment in kind (Labour exchange)	Page 4
556 to 572	Relief, gifts, loans, targeted feeding	Page 5
573 to 582	Wild food, fish, game & other food sources (e.g. stocks)	Page 5
583 to 608	Casual labour, employment and remittances in cash	Page 6
609 to 635	Self-employment, small business and trade	Page 6
636 to 645	Other cash income (gifts, loans)	Page 7
646 to 680	Expenditure	Page 8
Detailed Results Summary		
688 to 750	Food summary	
752 to 830	Income summary	
832 to 844	Expenditure summary	
Cross-checks		
848 to 855	Labour payments	
857 to 864	Crop production per unit area cultivated	

Data entry into the 'Data' sheet

The sheet is divided into two sections. On the left (columns B to AJ) is space to enter data from each of the individual wealth group interviews. To the right (columns AL to AO) is space to enter the summary result for each wealth group (i.e. the result from the final data analysis).

The sheet is set-up to match the structure of Interview Form 4. This simplifies the process of data entry. Data from the first page of Form 4 (wealth characteristics) are entered into sheet 'WB' (see above), and data required for the analysis of food, income and expenditure are carried over from there to the 'Data' sheet (rows 40 to 57).

Data on livestock production are entered first (**page 2** of Interview Form 4) then data on crop production (**page 3**) and so on (see **Table 3**).

The spreadsheet uses the basic data entered to calculate the amount of food and cash income obtained from each source in the reference year (see **Box 8**). Data entered by the user are recorded in the un-shaded cells of the spreadsheet, while calculations are performed in the shaded cells. Light yellow shading indicates a calculation of either food or cash income. Orange shading indicates a cross-check on the data. All shaded cells are locked to prevent accidental erasure of the formulae they contain. (Note that the 'locking' only works if the sheet is protected. If the sheet is unprotected, then there is a risk that some of the formulae in these cells may be deleted in error.)

Box 8: Examples of individual data entry into the 'Data' Sheet

These examples show individual data from two interviews with groups of poor households. The examples show how data are entered for crop production, for purchase and for a source of cash income (weeding).

3	**WEALTH GROUP**	Poor	Poor
4	District	H/Wajir at	H/Wajir at
5	Village/settlement	Ara Aseged	Dejen
6	Interview number	1	2
221	**CROP PRODUCTION:**		
231	**Barley - Meher: kg produced**	400	500
232	kcals per kg	3390	3390
233	sold/exchanged (kg)	50	100
234	price (cash)	1.6	1.87
235	income (cash)	80	187
236	other use (kg)		50
237	kcals (%)	22%	22%

Crop Production:

For food crops, there is space to enter the number of kcals per kg of the crop (row 232 in the example), which is used to calculate % kcals (row 237).

There is also space to enter the amount sold (row 233), and price (row 234), the product of which gives cash income from sale of the crop (row 235).

Other use (e.g. seed) is recorded in row 236.

441	**FOOD PURCHASE:**		
442	**Barley/millet:** name of meas.	kg	kg
443	wt of measure	1	1
444	no. meas per month	60	80
445	no. months	8	5
446	kg	480	400
447	kcals/kg	3390	3390
448	kcals (%)	30%	25%
449	price (per kg)	2.25	3
450	expenditure	1080	1200

Food Purchase:

Amounts purchased are entered (rows 442 to 445 in the example), along with the kcal content of the food (row 447) to calculate percentage kcals (row 448). Price paid is also entered (row 449), for the calculation of expenditure (row 450).

583	**OTHER CASH INCOME:**		
584	**Labour:** Weeding		
585	no. people per HH	1	3
586	no. times per month	8	12
587	no. months	2	1
588	price per unit	7	6
589	income	112	216

Cash Income:

For sources of cash income, there is space to record the amount of the item sold, and the price obtained.

In this example (weeding), the number of days worked is calculated as the product of no. people per household x no. times per month x no.months. This is multiplied by the daily labour rate (row 588) to obtain total income from weeding (row 589).

Many of the titles in column A are not locked (e.g. chicken sales – row 209, egg sales – row 212, most titles for crops, most titles for items purchased, etc.). These unlocked cells are shaded light green. The team leader can change these during the fieldwork so as to adapt the sheet to the local situation and to add food or income sources that are not included in the spreadsheet at the moment. e.g. you could change

other cereal: kg produced (row 280) to *sorghum - belg: kg produced*
other cashcrop: kg produced (row 409) to *tea: kg sold*

but remember that if you change the title of a food, you must also change the kcals/kg to the new value (see **Box 8**).

Although changes can be made, there are a number of rules that must be followed in terms of changing titles. This is because certain rows are reserved for certain types of data. These rules are set out in **Table 4**.

Table 4. Rules for changing green-shaded titles in Column A

Rows requiring particular care and attention are shaded orange below

Item	*Row*	*Reserved for the following type of data*	*Titles currently*
Livestock production	209 212 215 218	Any source of income from livestock not included elsewhere in the spreadsheet. *The title of the income source can be changed (e.g. to Camel hiring).*	Chicken sales Egg sales Skins Donkey hiring
Crops	222 225	Consumption of green crops. *The name of the season can be changed (e.g. to Green cons – gu) or a particular crop specified (e.g. to Green cons – maize)*	Green cons – Belg Green cons – Meher
	228	Sale of any green crop. *The name of the crop can be changed (e.g. to Green haricot beans sold)*	Green maize sold
	231 238	The main staple food crops grown in the LZ. *The title of the crop can be changed (e.g. to sorghum).*	Barley – Meher Wheat - Meher
	245 252	High value cereal crops (e.g. teff, wheat, etc.), for which the proportion sold in a bad year will increase. *The name of the crop can be changed (e.g. to Teff - Belg)*	Teff – Meher High value cereal - Meher
	259 266	Main pulses grown. *The name of the crop can be changed (e.g. to Cowpeas – Meher)*	Lentils Vetch
	273 280 287	Other cereal crops. *The name of the crop can be changed (e.g. to Sorghum – Belg)*	Sorghum – Meher Other cereal Other cereal
	294	Any reserve crop stored where it is grown, and the harvesting of which increases in a bad year, e.g. enset or cassava. *The name of the crop can be changed (e.g. to Cassava)*	Enset/cassava
	304 314 … 386	Any other type of crop grown in the LZ. *The name of the crop can be changed (e.g. to Sesame, Taro, etc.)*	Other crop
	396	Honey. *If bees are kept, then honey should be entered here. However, the title can be changed to any other crop if there is no space for additional crops elsewhere on the format.*	Honey

Table 4. Rules for changing green-shaded titles in Column A			
Rows requiring particular care and attention are shaded orange below			
Item	*Row*	*Reserved for the following type of data*	*Titles currently*
	406 409 … 437	Any type of crop grown for cash in the LZ. *The name of the crop can be changed (e.g. to Coffee, Ginger, etc.)*	Main cashcrop Other cashcrop
Food Purchase	442	This should be the main staple cereal purchased. *The name of the staple cereal can be changed (e.g. to Maize)*	Barley/millet
	451 460 469	Other basic staples purchased. Can include staple root or other crops (e.g. enset). *The name of the staple can be changed (e.g. to Maize)*	Wheat Teff Other Staple
	478	Main pulse purchased. *The name of the main pulse can be changed (e.g. to Cowpeas)*	Vetch
	487	Second pulse purchased. *The name of this item can be changed (e.g. to Cowpeas)*	Other pulse
	520 527	Other items purchased. *This includes items besides the main staples, pulses, sugar, meat, oil and milk, all of which are included elsewhere in the spreadsheet. The names of these items can be changed (e.g. to fish)*	Other purchase: Veg. Other purchase
Payment in Kind	535 541 547	Any payment in kind. *These titles can be changed to reflect the type of labour being paid for in kind (e.g. to Labour – harvesting). The titles can also be changed to reflect different types of exchange (e.g. exchange for milk).*	Labour: type Labour: type Labour: type
Other Food	573 578	Other sources of food. *The title can be changed to reflect the type of food (e.g. wild food, stocks, etc.).*	Other food: type Other food: type
Other Cash Income	584 590 596	Labour payments in cash. *The title can be changed to reflect the type of labour (e.g. labour – weeding, labour – urban).*	Labour: Weeding Labour: Harvesting Labour: Construction
	609 614 619 625	Various types of self-employment and petty trade. *The titles can be changed to reflect the type of self-employment (e.g. to handicrafts, to petty trade).*	Firewood Charcoal Other self-employment Other self-employment
	631	Safety net payments (in cash).	Safety net
	641	Other income. *Can be changed to any other type of cash income not included elsewhere in the spreadsheet (e.g. to loans).*	Credit

Box 9: Other notes on data entry into the 'Data' Sheet

- None of the kilocalorie calculations will work unless HH size has been carried over from sheet 'WB' into row 40
- Seasons for milk production. Data may be entered for up to 2 seasons or periods of lactation (labelled seasons 1 and 2 in the spreadsheet). Depending upon local circumstances, these two seasons could be wet and dry seasons. On the other hand, data can also be entered by stage of lactation (early lactation and late lactation).
- Space to record the type of milk sold (rows 94 and 102 for cattle). These provide space to enter the type of milk being sold, skimmed or whole. If it is skimmed milk that is being sold, then enter 0 in rows 94 and 102. For whole milk, enter 1.
- 'Other use' category for each type of milk. Two rows are included for each type of milk to take account of 'other' use besides sale (e.g. gifts). For cows' milk, these two rows are row 95 (season 1) and row 103 (season 2).
- 'ghee/butter (other use)'. One row has been included for each type of milking animal to take account of other use of ghee/butter, e.g. use to dress hair or payments for loaned animals. For cattle ghee/butter this is row 106. Enter the amount of ghee/butter going to other use as a positive number. In the case of payment for loaned animals, you may also want to add the amount received by the middle/better-off to the amount they consume. In this case, enter the amount of ghee/butter received by the better-off as a *negative* number (this ensures that the amount is added to own production rather than subtracted from it). Suppose that butter production by the poor equals 5 kg (this is calculated in row 105 in the case of cattle), and that all of this is given to the better off. Suppose also that each better off household receives butter from 2 poor households, then enter the payment as follows:

  ghee/butter (payment for loaned animals):
  poor: 5
  better-off: -10 (5 kg per poor household x 2 poor households = 10 kg)
- Specifying different numbers of milking animals by season. This is an option for goats and sheep, reflecting the fact that different numbers of animals may give birth in different seasons. (Note: If no data are entered for the second season, the default is to assume the same number of animals lactating in the 2nd as the 1st season.)
- Suppose you only have a total amount for a food source. In many cases the spreadsheet is set up to calculate the no. of kg from the number of local measures. In these cases, if you have the weight in kg, then enter the data as follows:

e.g.	Enset: no local measures	200
	name of measure	kg
	wt of measure	1
	kg	200

- Suppose you only have a total amount for an income source. In many cases the spreadsheet is set up to calculate the total income from a number of variables (e.g. firewood: no.people per HH x no.times per month x no.months x price per unit). It is best to collect all of these details in the field if possible, but if you only have the total amount of income, then enter the data as follows:

e.g.	firewood: no.people per HH	1
	no.times per month	1
	no.months	1
	price per unit	200
	income	200

Data analysis

Once data entry for each individual interview has been completed, the next step is to summarise the data by wealth group. The process of analysing the data on the two sheets ('WB' and 'Data') is very similar. It involves reviewing the individual results for each wealth group, deciding upon a figure that best represents the group as a whole, and then entering this result into the summary section of the spreadsheet (column AR in sheet 'WB'; columns AL to AO in the 'Data' sheet).

The logical point to start the analysis is with the wealth breakdown (sheet 'WB'). This is because it is important to finalise variables such as household size and livestock holding by wealth group before proceeding with the analysis of the food, cash income and expenditure data on the 'Data' sheet[1].

General points

Check the individual data for results set to zero. Are these valid and genuine results? E.g. If the number of oxen owned by the middle group is reported as {1, 2, 3, 'missing', 2, 2, 0, 1} then is the zero a valid result? If, based upon their findings in the field, the team feels that it is unrealistic for the middle to own no oxen, then the zero should be deleted and that data entry cell left blank.

Check the individual data for blank or 'missing' results. If only a few results are reported, what do the blank or 'missing' values mean? Should they be left blank or set to zero? E.g. suppose that the results for amount of a crop sold are {50, 100, 'missing', 'missing', 100, 150, 'missing', 'missing'}, do the 'missing' values really mean the question was not asked, or is the answer really zero (i.e. not everybody in the wealth group sells the crop)? If the latter, then the 'missing' results should be set to zero, so that the series becomes {50, 100, 0, 0, 100, 150, 0, 0}

Check the number of observations (count) to decide whether an item is typical for the wealth group (see **Box 10**).

Box 10: How to decide whether a particular item is typical for a wealth group

No. pf observations > zero (out of 8)	*Action (Summary Value):*
0-2	Not typical for the wealth group. Set to zero.
3-5	Not typical, but still significant. Enter a value equal to half the average of the non-zero results. E.g., if the results for sheep ownership are {0, 0, 1, 2, 3, 0, 2, 0}, the average of the non-zero results is 2, the range of ownership is 0-2 and mid-point or summary value is 1 (half the average of the non-zero results).
6-8	Can be considered typical for the wealth group. Calculate the summary value in the usual way (as set out in **Table 1**).

Check the individual results visually to decide if there are outliers or other results that should be excluded because they are atypical. This will require discussion among the team members of their findings and impressions from the field. If the team is happy that the quick

[1] In fact, the results for these basic parameters are carried over automatically from sheet 'WB' to the 'Data' sheet.

calculation provides a reasonable summary result, then they should transfer that value (either rounded up or down) to the summary column. Otherwise, the team should take an average of the results they do consider reasonable and enter that in the summary column. (Note: the quick calculation is an average of results excluding the highest and lowest values. It is meant as an aid to analysis, not to replace the process of visual screening and evaluation of the individual interview data).

Box 11: Summary section of the Baseline Storage Sheet

2		SUMMARY			
3	WEALTH GROUP	BASELINE			
4		Very Poor	Poor	Middle	B/Off
10	Food Summary: total (%)	92%	93%	93%	109%
11	crops	36%	55%	73%	91%
12	livestock products	0%	0%	2%	6%
13	payment in kind	0%	0%	0%	0%
14	purchase	51%	38%	18%	12%
15	food aid	5%	0%	0%	0%
16	gifts, other	0%	0%	0%	0%
17	Income Summary: total (birr) pa)	3230	3643	3980	3968
18	crop sales	118	390	560	1147
19	livestock product sales	162	293	450	751
20	livestock sales	91	540	1220	2070
21	employment (e.g. labour) + remittances	515	370	0	0
22	self-employment (e.g. firewood)	294	0	0	0
23	safety nets	750	750	0	0
24	other	1300	1300	1750	0
25	Expenditure Summary: total (birr pa)	3213	3429	3932	3936
26	Survival food	1429	1048	528	215
27	Survival non-food	92	132	211	452

Make full use of the comments columns (col AX in 'WB'; col AP in 'Data') to explain which results were excluded and why, or to comment on a particular feature of the livelihood zone (e.g. that the very poor rent out most of their land to the middle and better-off).

Specific points: Wealth Breakdown Data (Sheet 'WB')

Compare the results obtained from the community and wealth group interviews. If there seems to be a difference between the two sets of results, does the team feel that one set is more reliable than the other? If so, more weight should be given to the more reliable set of results.

Check that the wealth breakdown has a 'bell' shape (i.e. ideally the largest number of households in the middle wealth group) and is not highly skewed (i.e. with the largest number of households in the very poor or poor groups).

Specific points: Food, Income and Expenditure Data ('Data' Sheet)

If no data are available for a particular wealth group (e.g. the very poor), then leave the corresponding column in the summary blank (col AL for the very poor).

Cross-checks

A number of cross-checks are built into the baseline storage sheet, and there is also space for additional cross-checks in the extra calculations areas of sheets 'WB' and 'Data'.

Cross-checks of total food, cash income and expenditure

The two most basic cross-checks in HEA are as follows:

a) Total food access compared to 100%.	The guiding principle in HE field work is to try as best one can to account for fully 100% of minimum food needs. This is not always possible however, since it is not unusual for average total food intake (for the poor especially) to fall below 100% in the reference year. Anything less than an average of 90% is unusual, however, and indicates that one or more sources of food may have been missed or under-estimated. At the level of the individual interview, a total of less than 85% can be taken as indicating an unsatisfactory interview.
b) Comparison of total cash income and expenditure	It is self-evident that total cash income and expenditure must balance[2]. A difference between the two of more than 10% indicates the need for further follow-up, both during the interview and at the stage of analysing the data.

These two cross-checks are used at various stages in the analysis: first of all, during the interview itself, when the purpose of the rapid calculations is to complete these two cross-checks. The same cross-checks are repeated as the individual data are entered into the baseline storage sheet, and again at the stage of summarising the results by wealth group. Total food, cash income and expenditure are given, for both individual interviews and for the wealth group as a whole, in rows 10, 17 and 25 of the Baseline Storage Sheet (see **Box 11**).

Trends across wealth groups

A second type of cross-check is used during the final analysis. This is to check for consistent trends across wealth groups (from poor to better-off). This type of check is carried out for data in both the 'WB' and 'Data' sheets.

Sheet 'WB':

a) Change in household size	Household size may either increase or decrease with increasing wealth, or may indeed remain relatively constant. An increase can occur for a number of reasons. Often, wealthier households will take in one or more poorer relatives (as a means of providing assistance to a poorer household – and gaining the labour of the poorer household member in return). Or wealthier households may tend to be longer established, having had more time to accumulate assets such as livestock, and – of course – more time to have children and to increase household size than poorer households. The most likely reason for a decrease in household size with increasing wealth is more effective birth control.

[2] Unless there are either loans or savings. In household economy, however, loans are counted as a source of cash income, while savings are included in expenditure. The saving of cash is, however, relatively unusual in poor rural areas; if there is surplus cash this will most likely be invested in livestock or some other asset rather than being kept as cash.

b) increase in area cultivated c) increase in livestock holdings d) increase in other asset holdings	An increase in asset holdings is expected – obviously – as wealth increases.

Sheet 'Data':

a) increase in crop production	Food and cash income from crop production will generally increase with increasing wealth (see **Box 11**, rows 11 and 18). A possible exception could be an agro-pastoral livelihood, where it may be the poorer groups, with insufficient livestock holdings, that resort to cultivating crops to achieve self-sufficiency.
b) similar duration of lactation c) similar milk output per animal per day	In general, these two basic parameters of milk production are likely to be similar for all wealth groups. This will not always be the case, however. Where livestock are fed on crops residues, for example, both duration of lactation and daily milk output may be higher for the better-off wealth groups that produce more of these residues.
d) similar prices for milk/ghee/butter sold e) decrease in %milk/ghee/butter sold	Prices obtained for milk/ghee/butter should be relatively independent of wealth, unless there is a difference in the type of quality of product sold (e.g. skimmed vs. whole milk). Poorer groups will generally sell a higher percentage of their milk products than the better-off – because of the relatively high value of these items.
f) increase in number of animals slaughtered g) increase in number of livestock sold h) decrease in %off-take	While the number of animals sold and slaughtered will generally increase with wealth (as livestock holding increases), the percentage of the herd disposed of in these ways (i.e. the off-take) will generally decrease. This is because better-off households can generally afford to retain a larger number of animals in order to 'grow' the herd.
i) similar price for livestock j) similar price for crops sold	Prices obtained for these items will tend to be similar across wealth groups, unless there is a marked difference in either the quality of product sold (e.g. the better-off selling older, larger animals) or the timing of sales (e.g. the poor selling crops post-harvest, the better-off waiting until prices rise later in the year).
k) decrease in amount of survival food purchase and increase in sugar and oil purchase l) increase in expenditure on survival non-food items m) similar price for purchased	In most cases, the amount of staple food purchase will decrease with increasing wealth (in line with the increase in own production). On the other hand, purchase of non-staple and 'luxury' food items, and of non-food items, is likely to increase with wealth. Prices paid for purchased food items may not vary much by wealth group, unless there is a marked difference in the quality of item

items, e.g. maize, sugar, etc.	purchased.

Cross-check on area of land rented in/out

A number of other cross-checks can be done to check the consistency of results across wealth groups. In a livelihood zone where land is rented in/out, for example, the area of land rented in by the middle and better-off wealth groups should roughly equal the area of land rented out by the very poor and poor.

This type of cross-check makes use of what is known as a '100 households exercise'. For this type of exercise, calculations are performed across 100 households. E.g. in the case of renting in/out:

Land rented out by the very poor = % very poor households x average area rented out
…which in the example below
= 15 x 3 = 45

Land rented in by the middle = % middle households x average area rented in
…which in the example below
= 35 x 1 = 35

…and so on for the other two wealth groups.

Total landed rented out per 100 households is then totalled up (80 hectares in the example below) and compared with total land rented in (also 80 hectares).

Table 5. Example of a cross-check on land rented in/out – good agreement

Wealth breakdown		rented out		rented in	
		per HH	*total/100* HHs	*per HH*	*total/100* HHs
VP	15.0%	3	45		
P	35.0%	1	35		
M	35.0%			1	35
R	15.0%			3	45
total	100.0%		80		80

Where good agreement is obtained in this type of cross-check, it builds confidence in the results for area of land rented in/out and in the wealth breakdown results.

Where the agreement is poor (as in the example below), possible explanations include a) under-/over-estimation of area of land rented in/out by one or other wealth group or b) an incorrect wealth breakdown. In the example below, the poor agreement results from an over-estimation of the percentage of households in the very poor wealth group (25% of households compared to 15% in the example with good agreement).

Table 6. Example of a cross-check on land rented in/out – poor agreement					
Wealth breakdown		rented out		rented in	
		per HH	*total/100 HHs*	*per HH*	*total/100 HHs*
VP	25.0%	3	75		
P	35.0%	1	35		
M	25.0%			1	25
R	15.0%			3	45
total	100.0%		110		70

This type of cross-check can be done in the 'Extra Calculations Area' of sheet WB (cols AZ to BF).

Cross-checks on livestock herd dynamics

A set of reference values for herd composition and herd dynamics is given below for the 3 main types of livestock (cattle, camels and shoats). All the results are expressed per 100 animals at the start of the year. Different figures are given for different wealth groups, on the basis that rates of off-take (i.e. sale and slaughter) tend to be higher among the poor compared to the better-off (since the better-off can usually afford to retain a larger number of animals than the poor, and in this way to increase their herd size over time).

It is important to cross-check the field results against these reference values. This is not to say that the results from the field have to turn out the same as reference, but if there are differences between the two, an explanation has to be found. Suppose, for example, that the percentage of breeding females in the herd is relatively high. This could perhaps be because of many deaths among younger animals the previous year, e.g. due to drought or disease. Or suppose that the number of births among goats is higher than in the reference table. This could be because animals gave birth twice in the year (i.e. it was a good year) rather than just over once, which is the average in the longer term (and the average included in the reference table).

Table 7. Herd dynamics – reference values (per 100 animals at start of year)						
CATTLE	*Herds with Plough Oxen*			*Herds without Plough Oxen*		
Wealth Group	**P**	**M**	**R**	**P**	**M**	**R**
Total (start of year)	100	100	100	100	100	100
Oxen	0	19	16	0	0	0
Breeding females	47	38	32	41	41	41
Births	33	27	23	33	29	29
Sales/slaughter	31	32	11	31	16	16
Deaths	9	8	7	9	8	8
Purchase/gifts	7	13	0	7	0	0
Total (end of year)	100	100	105	100	105	105
Offtake (%)	31%	32%	11%	31%	16%	16%

	CAMELS			*SHOATS*		
Wealth group	**P**	**M**	**R**	**P**	**M**	**R**
Total (start of year)	100	100	100	100	100	100
Breeding females	62	54	54	55	55	55
Births	27	24	24	66	66	66
Sales/slaughter	23	11	11	63	31	31
Deaths	9	8	8	24	24	24
Purchase/gifts	5	0	0	22	0	0
Total (end of year)	100	105	105	100	110	110
Offtake (%)	23%	11%	11%	63%	31%	31%

These cross-checks on the livestock data are carried out on sheet 'WB'. Two examples are given on the next two pages. Both of these are for the better-off wealth group. It is usually a good idea to start with this wealth group, as they tend to own the largest number of animals and the results per 100 animals are therefore easier to interpret[3]. Once the basic picture for the better-off has been established, this can also help in terms of interpreting the results from other wealth groups with smaller numbers of animals.

Once the livestock profile exercise has been completed, transfer the following results for the four wealth groups from the summary section of sheet 'WB' to the summary section of sheet 'Data':

No. births - transfer to number of milking animals
No. sold - transfer to camel, cattle or shoat sales
No. slaughtered - transfer to camel, cow or shoat meat

Box 12: Additional points to consider when analysing livestock data

- Does total herd size include calves as well as older animals? This will depend upon how the question was asked in the field, and how local people themselves think about their herds – they may ignore relatively young animals when counting their herd.
- Are oxen included in the total?
- If both goats and sheep are owned, might it be simpler to consider the total of goats and sheep together (i.e. the number of shoats). If there are very few of one type of animal, it can make more sense to add the two types together.

Note: These are issues the team leaders should resolve in the field.

[3] This is because with very small herd sizes, quite a small difference in absolute numbers can result in a big change per 100 animals. If only 4 animals are owned, for example, 1 animal sold per year corresponds to 25 animals per 100, while only one more animal (i.e. a total of 2) changes this figure to 50 animals per 100. This is something to bear in mind when comparing the field results for very small herds with the reference values.

Case Example 1. Herd dynamics cross-check for cattle

	A	B	C	D	E	F	G	H	I	J	AI	AJ	AK	AL	AM	AN	AO	AP	AR	AS	AT	AU	AV	AW
2			Community interviews								Wealth Group Interviews									range				
3	**WEALTH GROUP**										B/O	B/O	B/O	B/O	B/O	B/O	B/O	B/O	**summ**	**from**	**to**			
94	**Cattle:** total owned at start of year	B/O	10	6	8	6	10	15	6.5	6	3	4	3	5	9	4	3	4	6	3	9	per 100	6.0	16
95	adult females	B/O	4.5	2	2.5	2	4	11	3.5	2	2	2	1	2	3	6	1	2	3	1	5	50	2.8	16
96	no.born during year	B/O									2	1	1	1	3	3	1	2	2	1	3	33	1.7	8
97	no. sold	B/O									2	1	0	1	0	2	1	1	1	0	2	17	1.0	8
98	no. slaughtered	B/O									0	0	0	0	0	0	0	0	0	0	0	0	0.0	8
99	no. died	B/O									1	0	0	0	0	3	0	0	0.25	0	0.5	4	0.2	8
100	no. bought	B/O									1	0	0	1	0	0	1	0	0	0	0	0	0.3	8
101	no. at end of reference year	B/O									3	4	4	5	9	4	4	5	6.75	4	9	113	4.3	8

The above figure shows a set of results obtained for cattle for the better-off wealth group. The figures given in the yellow shaded cells are calculated from the summary figures in col AR, but expressed per 100 animals owned at the start of the year. It is these numbers that are compared with the data in the reference tables above. The following were noted in this example:

Total owned and adult females: The quick calculation suggests total ownership (excluding oxen) of 6, of which 3 are adult females. This fits reasonably well with the reference data (41% of a herd without oxen expected to be adult females).

No. born during the year: 29 births are expected per 100. The individual data in cols AI to AP suggest between 1-3 births per year, with a mid-point of 2 (rounded up from 1.7), giving 33 births per 100 animals in the herd.

No. sold and slaughtered: 0-2 animals were sold and none slaughtered, corresponding to 17 animals per 100. This is very close to the reference figure of 16.

No. died: There were relatively few reports of deaths among cattle. The quick calculation suggests 0.2 deaths, which was rounded up to 0.25 for the summary, or 4 per 100 animals. The corresponding reference figure is 8 per 100 animals, i.e. deaths rates do seem to be quite low in the example, but not so low as to give cause for concern about the quality of the data.

No. bought: There were some purchases, but the team decided that zero was the typical value for purchase.

No. at end of reference year: This is calculated in the yellow-shaded cell as follows:

= no. at start of year
+ (births + purchases)
– (deaths + sales + slaughters)

The results suggest that the cattle herd may have grown 13% in the year, which is a little higher than the 5% in the reference table. The main difference is in the higher number of births and lower number of deaths compared to the reference data.

Case Example 2. Herd dynamics cross-check for goats

	A	B	C	D	E	F	G	H	I	J	AI	AJ	AK	AL	AM	AN	AO	AP	AR	AS	AT	AU	AV	AW
2			Community interviews								Wealth Group Interviews									range				
3	**WEALTH GROUP**										B/O	B/O	B/O	B/O	B/O	B/O	B/O	B/O	**summ**	**from**	**to**			
126	**Goats:** total owned at start of year	B/O	15	10	20		15	15	15	10	11	5	15	4	18	10	15	12	11	7	15	per 100	12.8	15
127	adult females	B/O	13	7	15		8	14	8	7	8	4	7	2	10	9	8	8	7	4	10	64	8.5	15
128	no.born during year	B/O									16	8	7	4	20	18	16	16	12	8	16	109	13.5	8
129	no. sold	B/O									8	4	4	2	7	5	5	5	5	2	8	45	5.0	8
130	no. slaughtered	B/O									0	0	1	0	1	1	0	0	0.5	0	1	5	0.3	8
131	no. died	B/O									4	0	1	0	4	3	4	8	2.5	2	3	23	2.7	8
132	no. bought	B/O									1	1	0	0	3	0	0	5	1	0	2	9	0.8	8
133	no. at end of reference year	B/O									18	8	16	6	23	19	22	20	16	12	26	145	17.2	8

The above figure shows a set of results obtained for goats for the better-off wealth group. The figures given in the yellow shaded cells are calculated from the summary figures in col AR, but expressed per 100 animals owned at the start of the year. It is these numbers that are compared with the data in the reference tables above. The following were noted in this example:

Total owned and adult females: The quick calculation suggests total ownership of 13, of which 8-9 are adult females. Slightly higher results were obtained in the community than the wealth group interviews. The team preferred to give more weight to the latter, setting total owned to 11 and no. adult females to 7. This gives a figure of 64 adult females per 100, a little higher than the reference figure of 55.

No. born during the year: The individual data in cols AI to AP suggest 2 births per adult female per year in most but not all cases. This is close to the theoretical maximum. The team decided to take 12 births as a representative figure (i.e. just under 2 per adult female).

This gives a rate per 100 animals of 109, which is high, but not impossibly so, compared to the reference table (a long-term average of 66 per 100 animals).

No. sold and slaughtered: The quick calculations in col AV suggests a total of 5 sold and 0.5 slaughtered, making a total offtake of 50 per 100 animals (sales plus slaughters together). This is high compared to the reference value of 31, but is not impossible given the relatively high number of births per 100 animals.

No. died: The team accepted the results of the quick calculation, equivalent to 23 deaths per 100 animals, very close to the reference value of 24.

No. bought: An average of 1 animal was bought.

No. at end of reference year: The calculated end of year figure is 16, which corresponds to 145 animals per 100 at the start of the year. This is high compared to reference (110), reflecting mainly the relatively high number of births in the year.

Cross-check on cash income from local labour

This is another example of a cross-check of the consistency of results across wealth groups. In this case the cross-check is to compare cash income received from local labour (by the poor) with expenditure on local labour (by the middle and better-off). This cross-check is built into rows 848-855 of the 'Data' sheet (see **Box 13**).

The cross-check is another '100 households exercise' similar to the check on land rented in/out (**page 19**). The first step is to calculate total income from local labour (per 100 households). This is done in rows 851 and 852.

Box 13: Cross-check on cash income from local labour

	A	AL	AM	AN	AO
3	**WEALTH GROUP**	**BASELINE**			
4		**Very Poor**	**Poor**	**Midd-le**	**B/Off**
847	**Cross-checks**				
848	**(1) Labour payments**				
849	% households	20%	30%	35%	15%
850	income from local labour	240	205	0	0
851	income per 100 HHs, by wealth group	4800	6150	0	0
852	total income per 100 HHs	10950			
853	expenditure on local labour	0	0	150	250
854	expenditure per 100 HHs, by wealth group	0	0	5250	3750
855	total expenditure per 100 HHs	9000			

In row 851, the calculation is done for each wealth group separately. In the above example, income from local labour for the very poor = % very poor households x total income from local labour (kwacha per household per year) = 20 x 240 = 4800.

In row 852, total income per 100 HHs is summed up across wealth groups.

The next step is to calculate total expenditure on local labour (again per 100 households). This is done in rows 854 and 855.

In row 854, the calculation is done for each wealth group individually. In the above example, expenditure on local labour by the middle = % middle households x expenditure on local labour (kwacha per household per year) = 35 x 150 = 5250.

In row 855, total expenditure per 100 HHs is summed up across wealth groups. This can then be compared with total income. The check, obviously, is that total income from local labour should roughly equal total expenditure. This is roughly true in the example (an expenditure or 9000 kwacha per 100 households vs. an income of 10,950).

Where there is a big difference between the two figures, there is usually a need to re-examine the individual interview data a little more carefully. The most likely reasons for income exceeding expenditure are a) over-estimation of the percentage of households in the poorer wealth groups and b) over-estimation of cash income from labour (i.e. an over-estimation of the number of people engaged per household, or the number of days worked per month, etc.).

One possible problem with the cross-check is the inclusion of cash income from labour that is not performed locally. The formulas in row 850 calculate the total cash income from labour entered into rows 584 to 601 (and carried down to the cash income summary in rows 814 to816). If this includes labour that is not paid for by better-off households locally (e.g. urban labour), then the formula in row 850 has to be modified to reflect this. Suppose, for example that the three sources of labour are local weeding (summary row 814), local harvesting (summary row 815) and urban labour (summary row 816), then the formula in cell AL850

has to be changed from 'SUM(AL814:AL816) to 'SUM(AL814:AL815)', and similar changes have to be made to cells AM850, AN850 and AO850.

Cross-check on crop production per unit area cultivated

The second cross-check built into the 'Data' sheet looks at crop production per unit area cultivated (rows 857 to 864, see **Box 14**). The idea here is to compare the yields obtained per unit area across the different wealth groups. This calculation is a little complicated, but works as follows:

Box 14: Cross-check on crop production per unit area cultivated

	A	AL	AM	AN	AO
3	WEALTH GROUP	BASELINE			
4		Very Poor	Poor	Midd-le	B/Off
847	Cross-checks				
857	(2) Crop production per unit area cultivated				
858	% kcals from crop production	36%	55%	73%	91%
859	cash income from crop sales	118	390	560	1147
860	cost of 100% kcals	2713	2713	3165	3165
861	% kcals purch with crop income	4%	14%	18%	36%
862	total kcal production	40%	69%	91%	128%
863	total kcal production (adj to HH size 6)	40%	69%	106%	149%
864	total kcal production (HH size 6) per unit area	20%	20%	19%	24%

1) Carry down the %kcals obtained from crop production (row 858)
2) Carry down the cash income from crop sales (row 859)
3) Convert cash income from crop sales into an equivalent %kcals (row 861), where the equivalent %kcals is equal to the amount of staple kcals that could be purchased with the cash obtained from crop sales. This is done in two steps:
   a) Calculate how much it would cost to purchase 100% of kcals, based upon the price of the main staple purchased (row 860)
   b) Divide crop sales income by the cost of purchasing 100% of kcals (row 861).
4) Sum up rows 858 and 861 to get total production in kcal terms (row 862)
5) Adjust total production in kcal terms for the different household size of each wealth group. This is necessary because the results in row 862 are not directly comparable, as household size may vary from one wealth group to another. In row 863 total kcal production is adjusted to a standard household size of 6. In effect the question becomes, what percentage of annual food needs for a household of 6 could be covered by production from each wealth group. The answer to this question is given in row 863.
6) Divide total production in kcal terms by area cultivated to derive an estimate of production per unit area (i.e. yield).

In general terms, yield is expected to increase as wealth increases, e.g. because of more effective and timely land preparation and weeding, greater use of inputs, etc. This is not always the case, however, as in the example above. Sometimes, the kcal yield obtained by poorer wealth groups can be relatively high because they cultivate a greater proportion of crops with a relatively high food energy yield, such as cassava or sweet potatoes. This is not the explanation in the case of **Box 14**, however. Here the similar yields of each wealth group are explained by the fact that the poorer groups rent out quite a lot of land to the middle and better-off in return for a share of the harvest. One effect of this is that they are able to some extent to share in the higher yields obtained by the better-off.

Additional cross-checks to consider

The list of cross-checks suggested above is not exhaustive. There will certainly be other cross-checks that can be done depending upon the conditions prevailing in each livelihood zone. Other possible cross-checks to consider include:

- Gifts received by the poor compared to gifts given by the better-off. This would be a '100 households exercise' similar to the local labour income/expenditure cross-check. Cross-checks can be done for different types of gifts, e.g. gifts of money, crops, milk, etc.
- A check on the number of livestock bought compared to expenditure on livestock investment.
- A rough check on labour availability within the household and whether this is adequate to cover the cumulative labour input into different types of employment and self-employment. This involves considering the number of people capable of working within the household, when different types of activity are carried out (by examining the seasonal calendar), and, therefore, whether there are enough people available at different times of year to complete all the activities being undertaken

PART TWO: OUTCOME ANALYSIS

HOW TO RUN AN OUTCOME ANALYSIS: THE SOMALIA EXAMPLE

Part two of this chapter provides step-by-step instructions on how to run an outcome analysis, using an example supplied by the Food Security Analysis Unit in Somalia. For this part of the chapter you will need to use the files located on the accompanying CD. Please read **Annex B: The Spreadsheets** for further instructions on how to manage the files on the CD before proceeding with the exercises below.

Components of the Somalia Example Baseline

The examples used throughout this part of the chapter refer to two livelihood zones in Boroma District, northern Somalia. Details for these two zones are given in the table below:

Table 8. Details of the two case study baselines used in remainder of the chapter

Livelihood Zone	*Type of Livelihood*	*Reference Year*	*LZ Code*	*Baseline filename*
North-West agro-pastoral	Agro-Pastoral	Aug'01 – Jul'02	NWA	NWA.xls
Golis-Guban pastoral	Pastoral	Dec'96 – Nov'97	GUP	GUP.xls

Box 15. Example scenario used in this chapter

The example used throughout the rest of this chapter is a hypothetical scenario looking at the impact of a protracted drought affecting Boroma District in northern Somalia. The scenario is as follows:

- A 50% reduction in crop production
- A roughly 50% reduction in livestock holdings
- A significant reduction in milk production among surviving animals
- A significant decline in livestock prices
- A significant increase in staple food prices

Boroma includes two livelihood zones, one of which is agro-pastoral (the North-west Agro-pastoral LZ) and one pastoral (the Guban pastoral LZ). The rest of this chapter takes the reader through the analysis for these two very different livelihood zones, and for households living at different levels of wealth within each. It explains how the output from a Household Economy analysis can be used to estimate the amounts of food and/or non-food assistance required and the number of beneficiaries at livelihood zone and district levels.

The reference year for the North-West agro-pastoral LZ begins in August, with the harvesting of main season green maize. The reference year for most pastoral zones in Somalia begins in June, the first month of the main *gu* rainy season. The Golis Guban pastoral LZ is an exception, since it benefits from coastal or *heys* rains which begin in December. Milk production therefore improves from December onwards, marking the beginning of the new consumption year.

This detailed field information for the example LZs is stored in two baseline storage sheets found in the Team Leaders Supplement directory in Annex B in the *Som_Ex sub*-directory.

The sheets are labelled: *NWA.xls* and *GUP.xls* for Northwest Agropastoral and Golis-Guban Pastoral, respectively.

Reference Year Crop Production and Market Price Data

The Food Security Analysis Unit in Somalia is mainly responsible for the collection of baseline information and monitoring key indicators throughout the year. It collects two main types of monitoring data for Somalia: crop production by district; and market prices by district market. These data have been analysed to generate reference year estimates of crop production and of market prices. The reference years and seasons for the example livelihood zones are given in the following table:

Table 9. Reference years and seasons for example livelihood zones

Livelihood Zone	*LZ Code*	*Type*	*Reference Year*	*Ref. Seasons for crops*	*Ref. Seasons for prices*	
					Post-harvest	*Pre-harvest*
North-West agro-pastoral	NWA	AP	Aug'01 – Jul'02	Gu-01, Dy-01	Nov'01-Jan'02	Feb'02-Jul'02
Golis-Guban pastoral	GUP	P	Dec'96 – Nov'97	N/A	N/A	N/A
Note: AP = agro-pastoral, P = pastoral, Dy=Deyr season						

In Somalia, market price data are aggregated to the level of the 'market region' for the purposes of analysis. Aggregated data for the North-West market region (in which both example LZs fall) have been used to calculate reference year prices.

For the North-west agro-pastoral LZ, post-harvest prices are required for the calculation of the crop sales price problem, and the post-harvest months for the livelihood zone are given in the table above. For staple foods, a purchase price is also required. For the Guban pastoral LZ, this has been calculated as the average price for the whole of the reference year (since purchases may be made at any time of year). For the North-West agro-pastoral LZ, however, the reference year purchase price has been taken as the average price for the pre-harvest months (i.e the 'hunger' period before the next harvest when most purchases are made), again as outlined in the table above.

The Problem Specification and Key Parameter Analysis

The process of problem specification is one of critically examining the effects of the hazard on each source of food, income and expenditure. This topic was introduced in Chapter 4 of the **Practitioners' Guide**, and is further elaborated in Session 8 (*Problem Specification and Key Parameter Analysis*) of Module 3 (*Outcome Analysis*) in the **Training Guide**. There can be quite a large number of these sources, not all of which are equally important, and it is therefore useful to identify the key sources – or key parameters - for each wealth group and each livelihood zone. A key parameter is here defined as **one that contributes significantly to total food or cash income, so that a reduction in access to that one source may have a significant effect on total access**.

What to monitor

A 'key parameter' is a source of food, income or expenditure that contributes significantly to total food or cash income such that a reduction in access to that one source would have a significant effect on total access.

An analysis of key parameters is incorporated into each of the baseline storage sheets. This is described in **Box 16**.

Box 16. The key parameter analysis section of the Baseline Storage Sheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
931	**Key parameters analysis**													
932	**cut-off for significance (% kcals)**		5%											
933			VP	P	M	B/O		VP	P	M	B/O			
934	cost of 100% kcals		0	972	1134	1457								
935													key parameter?	
936	**CROPS:**												quant.	price
937	maize - gu			16%	17%	16%							yes	
938	maize - deyr			0%	0%	0%								
939	sorghum - gu			39%	53%	82%			7%	12%	26%		yes	yes
940	sorghum - deyr			0%	0%	0%			0%	0%	0%			
941	other cashcrop			0%	33%	48%							yes	yes
942	**LIVESTOCK PRODUCTION::**												quant.	price
943	cows' milk - gu-ha			25%	52%	85%							yes	
944	cows' milk sales - Gu-Ha								22%	44%	65%			yes

Note: VP = very poor, P = poor, M = middle, B/O = Better-off

The above figure shows part of the key parameter analysis for the North-West agro-pastoral LZ. The analysis can be found beginning at row 931 in each of the baseline storage sheets. Sources of food or cash that contribute significantly to total income (food and/or cash) are identified by the word 'yes' in column M. This means that it is important to monitor the ***amount*** of that income source in the current compared to the reference year. If it is also important to monitor the ***price*** of the item (i.e. it is an important source of cash as opposed to food income), then this is additionally indicated by the word 'yes' in column N.

The results from the example above indicate that *gu* season maize is an important source of food but not of cash (indicated by 'yes' in column M and the absence of 'yes' in column N). In other words, it is important to monitor the amount of maize produced, but not its sales price. *Gu* season sorghum is, on the other hand, an important source of both food and cash income (as indicated by 'yes' in both columns M and N), and in this case it is important to monitor both quantity and price. Likewise, it is important to monitor both the quantity and price of *gu* season cows' milk, and so on.

In terms of the calculations, the first thing is to define a cut-off for significance. This is set as a percentage of annual food needs (%kcals), and is set to 5% in the example (cell C932). The next step is to calculate the total amount of income from each source for each wealth group, where total means the total from food and from cash added together, including any expandability. For the purposes of this calculation, cash is converted to food equivalents by dividing the amount of cash by the cost of 100% of kcals (i.e. the cost of purchasing 100% of food energy needs for a typical household for the whole year, cells C934 to F934). From the example above, you can see that *gu* sorghum (food + cash income together) provides the equivalent of 39%, 53% and 82% respectively for poor, middle and better-off households (cells D939 to F939). Considering cash income only (i.e. the amount of money derived from the sale of *gu* sorghum), this is equivalent to 7%, 12% and 26% of annual food needs for the three wealth groups (cells I939 to K939).

In mathematical terms a key parameter is then defined as a source of income that:

a) provides more than the cut-off level of income for at least two wealth groups
OR
b) provides more than twice the cut-off level of income for one wealth group.

In the example, *gu* sorghum is a key parameter in terms of both quantity and price because it passes this test for total income (food + cash, i.e. quantity) and for cash income alone (i.e. price).

The table below summarises the main sources of food and cash income for Somalia, based upon key parameter analyses for all 15 livelihood zones for which baseline data are available. It also indicates (with an 'X') which specific items are significant for the two livelihood zones used as examples throughout this guide, the North-West agro-pastoral LZ (NWA) and the Guban pastoral LZ (GUP).

Key parameters for Somalia

	NWA		GUP	
	Food	**Cash**	**Food**	**Cash**
Livestock production				
camels milk – *gu* & *deyr*			X	X
cows' milk – *gu* & *deyr*	X	X		
shoats' milk – *gu* & *deyr*	X	X	X	
Sale of camels – export & local				
Sale of cattle – export & local		Local		
Sale of shoats – export & local		Local		Local
Crop production				
maize – *gu* & *deyr*	Gu only			
sorghum – *gu* & *deyr*	Gu only	Gu only		
cowpeas – *gu* & *deyr*				
other crops		X		
Other income sources				
gifts/social support	X		X	X
ag.labour – *gu* & *deyr*		X		
lab.migration				
Remittances		X		X
Firewood				
Charcoal		X		
petty trade				
Other income sources				

Note: Grey shading indicates an insignificant source for Somalia as a whole, e.g. sales of camels provide a source of cash but not of food.

Key parameter and problem specification sheets

The integrated spreadsheet (see page 58) contains relevant reference data for all of the above key parameters. If, however, an analysis is to be run either by hand or using the single zone analysis sheets, then the user will need to complete one or more *key parameter and problem specification sheets*. These worksheets list the key parameters for a particular LZ, and set out the procedure for calculating a problem specification for each key parameter. Two examples are described below for the example scenario, a protracted drought affecting Borama District in northern Somalia. Borama contains two livelihood zones, the North-West agro-pastoral and the Guban pastoral LZs, and soft copies of the example problem specification sheets for these can be found on the accompanying CD, in the Team Leaders' Supplement directory, Annex B in the *\Som_ex* sub-directory.

Example 1 – Borama District, North-West Agro-Pastoral LZ

The first thing for the user to do is to complete the header information at the top of the form (District, Livelihood Zone, Reference year and Current year).

Problem Specification – Quantity

The first section of the sheet deals with the crop production problem. The key parameters for crop production in this livelihood zone are *gu* season maize, *gu* season sorghum and 'other cashcrops' (a combination *khat*, tomatoes and fodder). In this section of the form, the user enters reference and current year data on production for the particular district (Boroma in this case) and then calculates the problem specification – current as a percentage of reference production – in the right-hand column. (Note that the problem specification for crops is based in this case upon district-level data, not upon data for the specific livelihood zone. As there is only one crop-producing LZ in Borama, this is not an issue in this case.)

The Crop Production Problem

KEY PARAMETERS AND PROBLEM SPECIFICATION SHEET

District	Borama	**Reference year**	Aug 01-Oct 01
Livelihood Zone	North-West Agro-Pastoral	**Current year**	Example Analysis

PROBLEM SPECIFICATION - QUANTITY

CROPS	Reference year quantity	Current year quantity	Current quantity as %of reference quantity
Maize – Gu	300 MT	150 MT	50%
Sorghum – Gu	1320 MT	660 MT	50%
Other cashcrops[1]	N/A	N/A	50%

[1] Khat, vegetables and fodder crops

For those crops for which there are no reference data (such as the 'other cashcrops' in the current example), the user can decide to set the problem for production at reference year levels (problem spec. = 100%) or may estimate the problem specification this year. In this example, the problem spec. for 'other cashcrops' has been set at the same level as for maize and sorghum (i.e. 50%).

The Livestock Production Problem

LIVESTOCK	*POOR HHs*			*MIDDLE HHs*		
HERD SIZE	Ref. year	Curr. year	Curr/Ref % [1]	Ref. year	Curr. Year	Curr/Ref % [1]
Camels			a)			d)
Cattle	4	2	b) 50%	8	4	e) 50%
Shoats	8	4	c) 50%	30	15	f) 50%

[1] Use these results as the current problem for number of animals sold

Calculating the problem specification for livestock production is more complicated than for crop production. In Somalia (as in most pastoral or agro-pastoral settings) the key parameters of interest are a) the volume of milk production and b) the number of animals that can be sold, both of which are determined by a wide range of factors of which the most important are herd size, herd composition and current production conditions.

Herd size is a key factor, and it is essential to determine whether herd sizes have changed significantly since the reference year. It is suggested that data on average herd size for the current and reference years should be collected for at least two wealth groups (the poor and the middle, since these are the largest groups), and the results recorded as set out in the

table above[4]. The herd size 'problem' can then be calculated by dividing current by reference year holding and multiplying by 100. This figure is then used in the calculation of both the milk production problem and the livestock sales income problem. Data collection efforts should focus on those types of animals that are significant in terms of local livelihoods. In the North-West agro-pastoral LZ, cattle and shoats are significant, but camels are not (since neither camel milk production nor camel sales are key parameters for this LZ).

The most important factors determining milk production in the current year (or the current season) are the number of animals giving birth (and therefore the number of milking animals per 100 adult females) and the milk output in litres per animal per day. It is suggested that information on these parameters should be collected for the current and reference years and a problem specification calculated for each variable as set out in the table below[5].

MILK PRODUCTION	No.milking animals per 100 adult females			Milk output (l/hd/day)		
	Ref. year	Curr. year	Curr/Ref %	Ref. year	Curr. year	Curr/Ref %
Camels - Heys/Gu			g)			h)
- Deyr			i)			j)
Cattle - Heys/Gu	45	35	k) 78%	2.75	1.75	l) 64%
- Deyr	45	35	m) 78%	2.25	1.5	n) 67%
Shoats - Heys/Gu	45	35	o) 78%	0.4	0.25	p) 63%
- Deyr	45	35	q) 78%	0.4	0.25	r) 63%

Note: In the North-West agro-pastoral LZ the two main seasons for milk production are *gu* and *deyr*. In the Guban pastoral LZ, coastal or Heys rains are important, and the main milk production season is *heys/gu*.

This information can then be combined with the herd size problem specification to estimate the overall problem for milk production in each of the seasons, where:

$$\text{Milk production problem} = \frac{\text{herd size prob.}}{100} \times \frac{\text{no.milking animals prob.}}{100} \times \frac{\text{milk output prob.}}{100} \times 100$$

Taking the example of cows' milk production for poor households in the *heys/gu* season:

a) herd sizes have fallen by 50%; herd size problem = 50%,
b) the number of animals giving birth has fallen from 45 per 100 adult females to 35 per 100 adult females; No. of milking animals problem = 78%
c) milk output has fallen from 2.75 litres per head per day to 1.75 litres; Milk output problem = 64%,

$$\text{and the consolidated or overall problem} = \frac{50}{100} \times \frac{78}{100} \times \frac{64}{100} \times 100 = 25\%$$

In other words, these three factors combined will have the effect of reducing milk production to 25% or one quarter of what it was in the reference year[6].

[4] Data on average herd size by wealth group in the reference year may be obtained from the baseline storage sheet.
[5] Reference year figures presented here for the number of milking animals per 100 adult females are based upon an analysis of the current Somalia baseline data and a comparison of these results with reference data for East African pastoral herds. Reference year milk outputs by season are averages of the available Somalia baseline data.
[6] Other factors that could be taken into account when calculating the overall milk production problem are a) a change in herd composition (i.e. an increase or decrease in percentage adult females in the herd) and/or b) a

The various calculations for the North-West agro-pastoral example are set out in the table below.

MILK PRODUCTION (continued)	*POOR HHs*			*MIDDLE HHs*		
	Formula		Result [2]	Formula		Result [2]
Camels - Heys/Gu	a) x g) x h)			d) x g) x h)		
- Deyr	a) x i) x j)			d) x i) x j)		
Cattle - Heys/Gu	b) x k) x l)	50%x78%x64%	25%	e) x k) x l)	50%x78%x64%	25%
- Deyr	b) x m) x n)	50%x78%x67%	26%	e) x m) x n)	50%x78%x67%	26%
Shoats - Heys/Gu	c) x o) x p)	50%x78%x63%	25%	f) x o) x p)	50%x78%x63%	25%
- Deyr	c) x q) x r)	50%x78%x63%	25%	f) x q) x r)	50%x78%x63%	25%

[2] Use these results as the current problem for quantity of milk production

Other sources of food and cash

The next step is to complete the specification of the 'quantity problem' for any other sources of food and/or cash identified as significant in the key parameters analysis. For the North-West agro-pastoral LZ, these are gifts (a source of food) and agricultural labour, remittances and charcoal (sources of cash). Detailed and quantified monitoring data are rarely available for these other sources of food and cash, which means there may be no data to enter in the 'reference year quantity' and 'current year quantity' columns. In this case the user can either assume constant access (problem spec. = 100%, as in the example for gifts, remittances and charcoal below) or may estimate a problem specification for this year.

Where there are potential sources of quantitative data that can use used to estimate a problem specification, it is important that these are followed up. In the case of remittances, for example, it may be possible to collect information on the amounts of money remitted via international transfer agents. In the case of charcoal, there may be information on amounts exported from the main ports, and so on.

OTHER SOURCES OF FOOD	Reference year quantity	Current year quantity	Current quantity as %of reference quantity
Gifts			100%

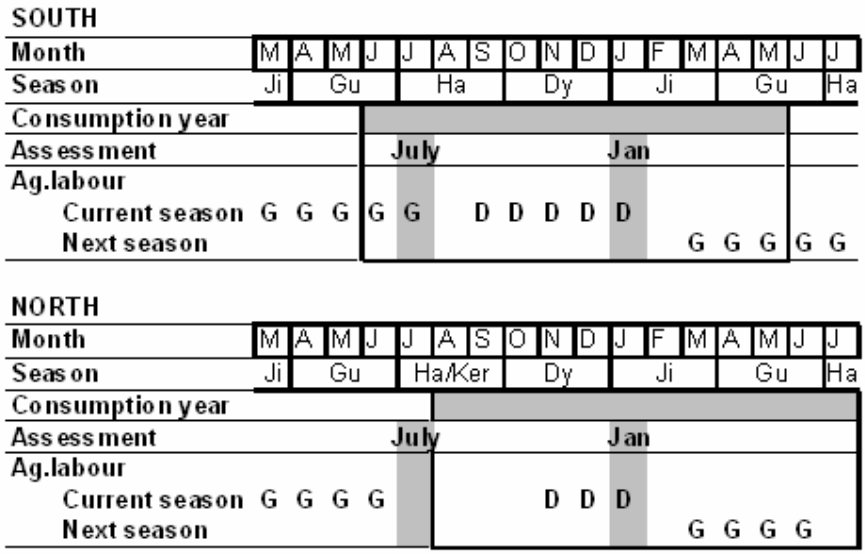
OTHER SOURCES OF CASH	Reference year quantity	Current year quantity	Current quantity as %of reference quantity
Ag.labour - Gu			75%
Remittances			100%
Charcoal			100%

Access to agricultural labour is a special case, since this may be related to the current year's level of agricultural production, for which there is data. However, the situation is complicated by the fact that the period for which the projection is being prepared relates to the future, and some of the labour performed in the projection relates to future rather than current harvests. This issue is explored in **Box 17** and
Box 18 below, which set out suggestions for specifying the agricultural labour problem in the south and the north of Somalia for assessments undertaken in July (i.e. post-*gu*) and January (post-*deyr*).

change in the duration of lactation. There is however a practical limit to the number of factors that can be assessed in the field – hence the proposal to limit the number of factors to the three most important.

The consumption year for agro-pastoral LZs in the south of Somalia runs from June to May and the main *gu* season harvests are gathered in June and July, at the start of the projection period (i.e. the consumption year for which the projection is being prepared). This means that most of the agricultural labour for the current year *gu* harvest is carried out BEFORE the start of the projection period, and most of the labour carried out during the projection period relates to future agricultural seasons, the outcome of which will not be known until later in the year. Where labour has still to be carried out it is usual to assume the same level of agricultural activity as in the reference year (problem specification = 100%). The situation in the north is similar, except that the consumption year starts slightly later (in August) and agricultural activities on the current year *gu* crops continue into the *deyr* season (long cycle *gu* crops being harvested during the *deyr* season).

Box 17. Consumption year in relation to labour period



Note: Ji-Jilaal, Ha=Hagaa, Dy=Deyr, Ker=Keren, G = Gu season labour, D=Deyr season labour

Box 18. Recommendations for specifying the agricultural labour problem

	Gu season assessment (July)	*Deyr season assessment (Jan)*
South	Current *gu* season labour is almost complete. The projection covers the next 12 months and includes labour during the next *deyr* season (set to 100%) and the next *gu* season (set to 100%)	Labour for the *deyr* season will have been completed by this stage. Set *deyr* season labour proportional to *deyr* season harvests and *gu* season labour to 100%.
North	The situation is a little more complicated in the north because there is little *deyr* season production and the main labour activity in the *deyr* is harvesting of long cycle crops planted in the *gu*. Production of these crops is partly dependent upon *deyr* (or *keren*) rains, and it is probably best to set *deyr* season labour to normal unless it is already known that there will be little or no harvest in Nov/Dec.	Labour for the *deyr* season (mainly harvesting of crops planted in the *gu*) will have been completed by this stage. Set *deyr* season labour proportional to *gu* season harvests and *gu* season labour to 100%.

Returning now to the North-West Agro-pastoral example, let us suppose that we are preparing a problem specification for an assessment in January. The recommendation in this case is to set *deyr* season labour proportional to *gu* season harvests (i.e. 50% of reference) and *gu* season labour to 100%. Unfortunately, the North-West agro-pastoral baseline includes only one single category for agricultural labour, with no split between *gu* and *deyr* seasons. In this case the simplest thing to do is to assume that half the labour is carried out in the *gu* season and half in the *deyr* season and to set the problem spec. for agricultural labour to 75% (i.e. half way between 50% and 100%). This is what has been done in the example.

Problem specification – prices

In the North-West agro-pastoral LZ, significant amounts of cash income are obtained from the sale of *gu* season sorghum and from 'other cash crops'. The production or quantity problem has already been calculated and it remains to consider the price problem. Most sorghum is sold immediately post-harvest (between November and January) and this is therefore the period for which reference and current year prices are required. For an assessment carried out in January (as in the example), both sets of prices may be obtained directly from the available monitoring data, and the price problem specification calculated as set out in the table below. In this example, which deals with a year in which sorghum harvests have failed, the scenario is for sorghum prices to remain relatively high post-harvest - 50% higher than in the reference year. Multiplying the price problem (150%) by the quantity problem (50%) gives the overall or consolidated problem (75% in the example).

The Crop Sales Problem

PROBLEM SPECIFICATION - PRICES

CROP SALES	Months sold	Ref. year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Sorghum – Gu	Nov-Jan	1200 SS/kg	1800 SS/kg	150%	50%	75%
Other cashcrops	N/A	N/A	N/A	150%	50%	75%

Note: The consolidated or overall problem for income is the product of the price problem x the quantity problem, e.g. for Sorghum – Gu sales = 150% (price) x 50% (quantity) = 75% (cons. problem)

There are no data on the prices for 'other cash crops', and an assumption has therefore to be made concerning the price problem for these crops. In the example a 50% increase in price has been assumed (given the reduction in production).

The problem specification form continues with the calculation of the price problem for the sale of milk and milk products, and for the sale of live animals. This section of the format is reproduced below for the North-West agro-pastoral example.

The Livestock Sales Problem

MILK/GHEE/BUTTER SALES	Months sold	Ref. year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Cows' milk - Heys/Gu[3]	All year[4]	2426 SS/l	3750 SS/l	155%	25%	39%
- Deyr				155%	26%	40%
Sheeps' ghee/butter				155%	25%	39%

[3] Price data only available for camels' milk , so this is used to set the price problem for all milk products
[4] Insufficient information in the baseline on months when milk sold, so average 12-month price taken

LIVESTOCK SALES	Months sold	Ref. year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Camels						
Cattle	All year	416021 SS	200000 SS	48%	50%	24%
Shoats	All year	63078 SS	30000 SS	48%	50%	24%

In this case all current year prices are estimates, since they relate to the average price for the whole year (i.e. they relate in part to the future). These estimates can be derived from an analysis of existing monitoring data and possible trends in these and/or from the results of interviews with traders in these various commodities.

As far as the example is concerned, prices of milk, ghee and butter are expected to be higher in the current than the reference year (in line with the reduction in milk production), while livestock prices are expected to fall due to a combination of factors (mainly the poorer condition of animals and a larger number of animals offered for sale).

As in the case of crop sales, the overall or consolidated problem is calculated as the product of the price and quantity problems. For livestock sales, the quantity problem is taken as equal to the herd size problem (i.e. it is assumed that the number of animals that can be sold is proportional to the size of the herd). Since both livestock prices and herd sizes are lower, the overall effect is a significant reduction in income from livestock sales in the current compared to the reference year.

Other sources of cash

It remains to specify the price problem for other sources of cash (agricultural labour, remittances and charcoal in the example). For remittances, the question of price is not relevant (since there is no price for remittances, and it is only the amount of money, i.e. the quantity, that can change). For other items, where price data are available from the monitoring system these can be used to develop a price problem specification as for other sources of cash income. Often, however, price data are not available for these items and the price problem has to be estimated. In the example, we have assumed no change in the price of agricultural labour or charcoal.

Other Sources of Cash

OTHER SOURCES OF CASH	Months sold	Ref. year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Ag.labour				100%	75%	75%
Remittances				N/A	100%	100%
Charcoal				100%	100%	100%

There is an additional consideration to be borne in mind for certain sources of cash, which relates to the assumption that has been made regarding expandability. In Chapter 4 of the **Practitioners' Guide**, in the section on 'expandability', it was explained that no expandability should be assumed for either local labour or self-employment (see **Table 4** in Chapter 4), which includes sale of charcoal. This is because any increase in the amount of these items sold is likely to be counteracted by a reduction in their price, so that total income from these sources is likely to remain relatively constant. It follows that in this situation, where no expandability is assumed, there should be a balancing assumption of no change in price. In other words, for items such as local casual labour, the price problem should be set to 100% even if a reduction in prices is anticipated or actually occurs.

Expenditure items

The final step is to specify the price problem for three categories of expenditure; survival food, survival non-food and livelihoods protection. In the North-West agro-pastoral LZ, the staple food is sorghum, and most purchases are made in the period February-July. Since the example deals with an assessment being carried out in January, i.e. before the main months of staple purchase, it follows that the average purchase price for the current year will have to be estimated (see example of this in Chapter 4, **Box 3**). In the Somalia example, the current year price has been estimated at 2800 SlSh per kg, which is almost exactly twice the price in the reference year (see table below).

Expenditure Items	Months purchased	Ref. year	Current year	Current/ref % (Price)
Staple Food (Sorghum)	Feb-Jul	1408 SS/kg	2800 SS/kg	199%
Survival Non-food Basket				100%
Livelihoods Protection Basket				100%

It is possible to specify a problem specification for the livelihoods protection expenditure basket if necessary; similar calculations can be done for the cost of the survival non-food basket. For the North-West agro-pastoral example, however, no change in the prices of these baskets has been assumed (price problem = 100%).

Example 2 – Borama District, Guban Pastoral LZ

Borama District includes parts of two livelihood zones, the North-West agro-pastoral (dealt with above) and the Guban pastoral LZs. **Box 19** deals with the preparation of a problem specification for the Guban pastoral LZ, given very similar conditions to those specified for the North-West agro-pastoral LZ. There is no crop production in the LZ, so there is no problem of crop production to specify. The other major difference is that camels and shoats are kept in the Guban pastoral LZ, rather than cattle and shoats. As in the North-West agro-pastoral LZ, herd sizes have fallen compared to the reference year, fewer animals are milking and milk outputs are much reduced[7].

[7] Note that different changes in herd size have been specified for the two livelihood zones, but that the same problem has been specified for the no. milking animals and for milk output as in the North-West agro-pastoral example. This models an assessment in which herd sizes are assessed by livelihood zone, but changes in milk production are assessed at district level.

Box 19. Borama District, Guban Pastoral LZ problem specification

KEY PARAMETERS AND PROBLEM SPECIFICATION SHEET

District	Borama	**Reference year**	Dec'96 – Nov'97
Livelihood Zone	Guban Pastoral	**Current year**	Example Analysis

PROBLEM SPECIFICATION - QUANTITY

CROPS	Reference year quantity	Current year quantity	Current quantity as % of reference quantity
None			

LIVESTOCK	*POOR HHs*			*MIDDLE HHs*		
HERD SIZE	Ref. year	Curr. year	Curr/Ref % [1]	Ref. year	Curr. Year	Curr/Ref % [1]
Camels	1	0.5	a) 50%	11	5.5	d) 50%
Cattle			b)			e)
Shoats	37	15	c) 41%	135	55	f) 41%

[1] Use these results as the current problem for number of animals sold

MILK PRODUCTION	No. milking animals per 100 adult females			Milk output (l/hd/day)		
	Ref. year	Curr. year	Curr/Ref %	Ref. year	Curr. year	Curr/Ref %
Camels - Heys/Gu	40	30	g) 75%	3.5	2.5	h) 71%
- Deyr	40	30	i) 75%	3	2	j) 67%
Cattle - Heys/Gu			k)			l)
- Deyr			m)			n)
Shoats - Heys/Gu	45	35	o) 78%	0.4	0.25	p) 63%
- Deyr	45	35	q) 78%	0.4	0.25	r) 63%

MILK PRODUCTION (continued)	*POOR HHs*			*MIDDLE HHs*		
	Formula		Result [2]	Formula		Result [2]
Camels - Heys/Gu	a) x g) x h)	50x75%x71%	27%	d) x g) x h)	50x75%x71%	27%
- Deyr	a) x i) x j)	50x75%x67%	25%	d) x i) x j)	50x75%x67%	25%
Cattle - Heys/Gu	b) x k) x l)			e) x k) x l)		
- Deyr	b) x m) x n)			e) x m) x n)		
Shoats - Heys/Gu	c) x o) x p)	41%x78%x63%	20%	f) x o) x p)	41%x78%x63%	20%
- Deyr	c) x q) x r)	41%x78%x63%	20%	f) x o) x p)	41%x78%x63%	20%

[2] Use these results as the current problem for quantity of milk production

OTHER SOURCES OF FOOD	Reference year quantity	Current year quantity	Current quantity as % of reference quantity
Gifts (rice)			100%

OTHER SOURCES OF CASH	Reference year quantity	Current year quantity	Current quantity as % of reference quantity
Remittances			100%
Gifts (goats to sell)			100%

On the prices side, the same changes in milk and livestock prices have been incorporated into the problem specifications as in the North-West agro-pastoral LZ (since the two LZs share the same markets). The main staple cereal in the Guban pastoral LZ is rice. The problem specified for rice assumes some increase in the price of rice given the very large increases in sorghum prices in the example (so that the current year price of rice – 2900 SlSh per kg – still exceeds that of sorghum – 2800 SS/kg).

PROBLEM SPECIFICATION - PRICES

CROP SALES	Months sold	Ref. year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
None						

MILK/GHEE/BUTTER SALES	Months sold	Ref. year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Camels' milk - Heys/Gu	All year[3]	2426 SS/l	3750 SS/l	155%	27%	42%
- Deyr				155%	25%	39%
Goats' milk - Heys/Gu[4]				155%	20%	31%
- Deyr				155%	20%	31%

[3] Insufficient information in the baseline on months when milk sold, so average 12-month price taken
[4] Price data only available for camels' milk , so this is used to set the price problem for all milk products

LIVESTOCK SALES	Months sold	Ref. Year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Camels	All year					
Cattle	All year					
Shoats	All year	63078 SS	30000 SS	48%	41%	20%

OTHER SOURCES OF CASH	Months sold	Ref. Year	Curr. year	Curr/Ref % (Price)	Curr/Ref % (Quantity)	Curr/Ref % (Pr.x Qu.)
Remittances				N/A	100%	100%
Gifts (goats to sell)				100%	100%	100%

EXPENDITURE ITEMS	Months purchased	Ref. year	Curr. year	Curr/Ref % (Price)
Survival food	All year	1955 SS/kg	2900 SS/kg	148%
Survival non-food				100%
Livelihoods Protection				100%

Additional notes on problem specification

Why not use current year prices directly?

In order to complete the outcome analysis we need information on the current prices for the main items bought and sold by different wealth groups. Since in many cases it is possible to obtain this directly from the market price monitoring system (e.g. the average price of a goat, or a kg of sorghum) why it is necessary to go through the process of calculating a price problem specification using current and reference year data? The explanation lies in a possible difference between the price recorded in the market (the monitoring data) and the price collected in the field at the time the baseline was prepared.

Take the price of goats as an example. According to the baseline storage sheet for the Guban pastoral LZ (GUP.xls), the average price for goats in the reference year was 80,000 SlSh. This compares with an average price from the monitoring data of 63,078 SlSh. There may be a number of reasons for this type of difference. It may be that the monitoring data

covers an area that includes more than one livelihood zone, and that prices differ between livelihood zones (and goat prices are in fact lower in the North-West agro-pastoral LZ than in the Guban pastoral – presumably reflecting a difference in the size and quality of animals sold). Or it may be that the quality and size of animal selected for monitoring is not quite the same as that usually sold by pastoralists or agro-pastoralists. Or that the price in the baseline represents a 'farm gate' price and not the selling price in the market. Whatever the explanation, it is clear that using a price directly from the monitoring system may not give the correct price at household level. On the other hand, it is reasonable to assume that prices will tend to change in proportion to one another, so that the best estimate of the current price at household level is obtained by multiplying the price in the baseline by the ratio of the current to the reference price from the monitoring data (i.e. by the price problem).

Taking inflation into account

Inflation significantly complicates the analysis of market prices and the derivation of the price problem. The effect of inflation is to increase prices generally, above and beyond any local effects of hazard. The problem is not so much with prices which are monitored and for which a problem specification is developed (as set out above), since the current problem will include any effect of inflation. The bigger problem is for prices for which no monitoring data are available (in which case it may be incorrectly assumed in the outcome analysis that no change in prices has occurred). The solution to this problem is to develop an inflation 'problem' and to make this the default problem in the absence of any monitoring data. In the North-West agro-pastoral zone, for example, the inflation problem could be applied to the price of agricultural labour, remittances and charcoal, and to the cost of the survival non-food and livelihoods protection expenditure baskets.

In order to calculate an inflation problem, we need an indicator of inflation. In Somalia, fluctuations in the value of the Somali Shilling (or Somaliland Shilling) compared to the US dollar are the main factor driving changes in local prices, and the simplest index of inflation is therefore the exchange rate itself. The inflation problem is then calculated as follows:

$$\text{Inflation problem} = \frac{\text{Current year exchange rate}}{\text{Reference year exchange rate}} \times 100$$

Reference year exchange rates have been calculated for each of the baselines, and these are recorded in the baseline storage sheets. The average reference year exchange rate for the North-West agro-pastoral LZ was 6725 SlSh per USD (August 2001 – July 2002). If the current exchange rate were 7500 SlSh, then the inflation problem would be 7500 ÷ 6725 x 100 = 112%, and so on.

The examples presented here and in subsequent chapters do not include any correction for inflation. The question of inflation and its effects is dealt with in greater detail later when dealing with the integrated spreadsheet.

Calculating a localised crop production problem

Many districts cover more than one livelihood zone, but there is only one set of crop production per district. A reasonable starting point for the analysis is to apply the same crop production problem to all livelihood zones within a district, i.e. to assume that if maize production is reduced by half at district level, then it will be reduced by half in each of the livelihood zones. Where there is evidence of localised failure, however, it is important to disaggregate crop production data to below district level. A example of how this was done for an analysis in Malawi is presented in **Box 20**.

Box 20. Calculating a localised production problem – an example from Karonga District in Malawi

In 2003, the maize production failure in Karonga district was localised to Central Karonga LZ, which consists of a single EPA, Central Karonga EPA. Data for this EPA were obtained by phone, and a sub-district problem specification calculated as shown in the table.

Example of Central Karonga – 2003

Maize Production (MT)			
	Reference year	*2003*	*2003 Problem Spec (% of reference)*
Karonga District	19,471	17,370	89%
Central Karonga EPA	7,449	4,651	62%
Remainder of district	12,022	12,719	106%

Note: Remainder of district calculated as Karonga District minus Central Karonga EPA.

Keeping a Record of Assumptions

It is inevitable that during an analysis of this type, many assumptions will be made. It is important that the analyst keep track of these, so that steps can be taken to follow them up when necessary. The Key Parameters and Problem Specification Sheets have space in which to do this. A record of the assumptions made in developing the example problem specification for the North-West agro-pastoral LZ is reproduced below.

ASSUMPTIONS

Component of Problem Specification	Source of Data	Assumptions	Confidence e.g. Good – no action required Poor – requires verification
Crop production: Maize – Gu Sorghum – Gu	FSAU post-harvest crop assessment	Data correct. Production failure across the whole of Borama district, affecting all parts of the district to a similar degree.	Good
Crop production: Other cashcrops (khat, tomatoes, fodder)	No information	That the same factors affecting maize and sorghum will have had similar effects on other cashcrops. This may not be the case for fodder (a failed crop may be a good source of fodder) or for khat and tomatoes where production of these crops is irrigated.	Poor – requires verification
Crop sales prices	FSAU price monitoring system	Data correct.	Good
Livestock production: Cattle and shoat herd size No.milking animals /100 adult females Milk outpts	FSAU field assessment	Data correct.	Good

OUTCOME ANALYSIS – PEN AND PAPER

There are a number of ways of undertaking the outcome analysis, of which the simplest is to use pencil and paper. A standard format for pencil and paper calculations was described in Chapter 4 (see **Box 5**) and a set of these formats containing the baseline data for the Somalia examples may be found in the file *\Pencil and paper analysis sheets - example.xls* in the *\Som_ex* sub-directory in the Team Leaders' Supplement Directory, Annex B. In common with the other analysis spreadsheets in this directory, there are links between this file and the baseline storage sheets, *NWA.xls* and *GUP.xls*. Care should be taken not to break these links (see instructions in **Annex A**.)

SCENARIO ANALYSIS SUMMARY

Livelihood Zone	Northwest Agro-Pastoral		Wealth Group		Poor
Baseline year/type	Aug-01 to Jul-02		HH Size		6
Current year/type	Example		% community HHs		40%
Table 1: Food	Baseline	Expandability	Baseline + Expandability	Current Problem	Final Picture
maize - gu	16%		16%	50%	8%
maize - deyr					
sorghum - gu	31%	8%	39%	50%	20%
sorghum - deyr					
cows' milk - gu-ha	3%		3%	25%	1%
cows' milk - de-ji	1%		1%	26%	0%
sheeps' milk - gu-ha	1%		1%	25%	0%
sheeps' milk - de-ji	1%		1%	25%	0%
goats' milk - gu-ha	0%		0%	25%	0%
goats' milk - de-ji	0%		0%	25%	0%
own meat					
gifts	12%	6%	17%	100%	17%
food stocks					
non-staple purchase	20%	-10%	10%	100%	10%
staple purchase	15%				44%
Total	99%				100%
Deficit					0%

Table 2: Income (cash)	Baseline	Expandability	Baseline + Expandability	Current Problem	Final Picture
sorghum sales - gu	70	-70		75%	0
sorghum sales - deyr					
other cashcrop				75%	
cows' milk sales - Gu-Ha	215		215	39%	84
cows' milk sales - De-Ji	84		84	40%	34
cows' ghee/butter sales					
sheep's ghee/butter sales					
cattle sales - export					
cattle sales - local	150	150	300	24%	72
goat sales - export					
goat sales - local	100	50	150	24%	36
ag.labour - gu	600		600	75%	450
ag.labour - deyr					
remittances	150	75	225	100%	225
charcoal	448		448	100%	448
gifts/social support					
loans					
Total	1,817				1349

Note: The unit for cash is thousands of Somaliland Shillings.

The file contains one sheet for each wealth group and each livelihood zone. Three columns of the format are already filled in. These are 'Baseline', 'Expandability' and 'Baseline + Expandability'. So all the user needs to do is to enter the current problem and to calculate the final picture. Two examples are presented here. These are for the Boroma district example – the North-West agro-pastoral and Guban pastoral livelihood zones.

Both examples are for poor households from these livelihood zones, and analyse the outcome resulting from the problem specification prepared above. The steps to complete the analysis are as follows:

1. Transfer the problem specification for each source of food and cash income from the key parameter and problem specification sheet to the 'current problem' column of the calculation format. Set the current problem to 100% for any source of food or cash income not included on the key parameter sheet. This includes non-food purchase.

Table 3: Expenditure (cash)	Baseline		Current Problem	Final Picture
Survival non-food	148		100%	148
Livelihoods protection	952		100%	350
Survival food	145			851
Other	571			0
Total	1,817			1349
Deficit				602

	Cost of 100% kcals				
Table 4: Staple Purchase	baseline cost	Price problem	current cost	cash available	%kcals
sorghum	972	199%	1934	1201	62%

2. Multiply the figures in 'Baseline + Expandability' by the corresponding 'Current problem'% and enter the result in the 'Final picture' column. Do this for all sources of food and cash income, except purchase.

3. Calculate total income (1349 and 915 SS in the two examples) and carry this down from Table 2 to the bottom right-hand cell of Table 3 (i.e. total expenditure).

4. Specify any change in the cost of the survival non-food and livelihoods protection baskets in the 'Current problem' column of Table 3.

5. Multiply baseline survival non-food expenditure by the 'Current problem' % and enter the result in the 'Final Picture' column.

6. Calculate the amount of money available for staple food purchase (= total expenditure – survival non-food expenditure), and carry this down to

SCENARIO ANALYSIS SUMMARY

Livelihood Zone	Guban Pastoral		Wealth Group		Poor
Baseline year/type	Dec'96 to Nov'97		HH Size		6
Current year/type	Example		% community HHs		25%
Table 1: Food	Baseline	Expandability	Baseline + Expandability	Current Problem	Final Picture
camels' milk - gu-ha	5%		5%	27%	1%
camels' milk - de-ji	2%		2%	25%	0.01
sheeps' milk - gu-ha	1%		1%	20%	0%
sheeps' milk - de-ji					
goats' milk - gu-ha	1%		1%	20%	0%
goats' milk - de-ji	1%		1%	20%	0%
own meat	3%		3%	100%	3%
gifts	15%	8%	23%	100%	23%
Survival non-food purchase	35%	-18%	18%	100%	18%
Survival food purchase	40%				37%
Total	103%				83%
Deficit					17%

Table 2: Income (cash)	Baseline	Expandability	Baseline + Expandability	Current Problem	Final Picture
camels' milk sales - Gu-Ha	156		156	42%	66
camels' milk sales - De-Ji	96		96	39%	37
goats' milk sales - Gu-Ha	120		120	31%	37
goats' milk sales - De-Ji	60		60	31%	19
skins	12		12	100%	12
goat sales - export					
goat sales - local	80		80	20%	16
sheep sales - export					
sheep sales - local	640		640	20%	128
remittances					
gifts: goats to sell	400	200	600	100%	600
loans					
Total	1,564				915

Table 4 (cash available).

Table 3: Expenditure (cash)	Baseline		Current Problem	Final Picture
Survival non-food	50		100%	50
Livelihoods protection	490		100%	0
Survival food	624			865
Other	400			0
Total	1,564			915
Deficit				490

Table 4: Survival food purchase	Cost of 100% kcals				
	baseline cost	Price problem	current cost	cash available	%kcals
rice	1559	148%	2307	865	37%

7. Enter the current staple food price problem into Table 4 (price problem) and multiply the baseline cost of 100% of kcals by the price problem to get the current cost of 100% kcals. Divide the amount of cash available for survival food purchase by the current cost of 100% kcals to calculate the % kcals that can be purchased in the current year.

8. Carry the % kcals that can be purchased up to the 'final picture'/purchase row of Table 1 and calculate total food access.

   If total food access is less than 100% (as in the Guban pastoral example), then calculate the survival deficit (Table 1). To complete the expenditure analysis, enter the amount of cash available for survival food purchase into Table 3 (under survival food), and enter zero for expenditure on 'livelihoods protection' and 'other' (since it follows that if there is a survival deficit, then there will be no spare cash for either 'livelihoods protection' or 'other' expenditure). Finally, multiply livelihoods protection expenditure in the baseline by the current problem for livelihoods protection expenditure and enter the result under 'deficit' in the 'final picture' column of Table 3 (this is the livelihoods protection deficit).

   If total food access is equal to or greater than 100% (as in the North-West agro-pastoral example), then calculate the %kcals that has to be purchased to bring total food up to 100% (44% in the example), and enter this for final picture/survival food purchase. Now multiply this figure by the current cost of 100% kcals in order to estimate current expenditure on survival food and enter this into Table 3 ('final picture'/survival food = 44% x 1934 = 851 in the North-West Agro-pastoral example).

   Continuing with Table 3, multiply baseline livelihoods protection expenditure by the current problem for livelihoods protection expenditure and note the result. Now calculate the amount of cash currently available for livelihoods protection expenditure (= total expenditure – survival non-food – survival food). If this is greater than (or equal to) the current cost of the livelihoods protection expenditure basket (just noted), enter the latter figure into 'final picture'/livelihoods protection expenditure. If it is less, then enter the amount of cash available for livelihoods protection expenditure into 'final picture'/livelihoods protection expenditure and enter the difference between the two figures (current cost – cash available) as the 'final picture'/livelihoods protection deficit.

   Taking the North-West agro-pastoral example, the amount of cash available for livelihoods protection expenditure is 1349 – 148 – 851 = 350, and the livelihoods protection deficit is 952 x 100% = 952 – 350 = 602.

   Finally, calculate expenditure on 'other' as total expenditure –survival non-food – survival food– livelihoods protection .

Summarizing the results:

Poor Households	*Survival deficit*	*Livelihoods protection deficit ('000 SlSh)*
North-West agro-pastoral LZ	0%	602
Guban pastoral LZ	17%	490

In other words, given the current problems specified for Borama district, the conclusion is:

> *Poor households in the North-West agro-pastoral LZ would face a livelihoods protection deficit but no survival deficit, while poor households from the Guban pastoral LZ would face both a livelihoods protection deficit and a survival deficit.*

What these deficits mean in terms of numbers of beneficiaries and amounts of assistance is discussed further in the next section, which deals with the single zone spreadsheet.

OUTCOME ANALYSIS – SINGLE ZONE SPREADSHEET[8]

Running the Outcome Analysis

The single zone spreadsheet is essentially a way of automating the pencil and paper analyses described in the last section. Besides speeding up the calculations, it has two additional advantages:

1) once the problem specification has been entered, the calculations are performed simultaneously for all three wealth groups in the livelihood zone and
2) a set of graphical outputs are automatically generated within the spreadsheet.

Copies of the two example spreadsheets (NWA analysis – example.xls and GUP analysis – example.xls) containing the example problem specifications can be found in the *\Som_ex* directory.

There are links between the single zone spreadsheets and the individual baseline storage sheets. Care should be taken not to break these links (see instructions in Error! Reference source not found.).

Each spreadsheet contains seven pages. Four of these contain the baseline data and perform the calculations, while three are graphics pages. The seven pages are as follows:

Page 1. Poor: The problem is specified on this sheet and the results calculated for poor households.

Page 2. Middle: The problem specified on the poor page is carried over to this page, where the results for middle households are calculated.

Page 3. Rich: The results for better-off or rich middle households are calculated on this sheet, again using the problem specified on the poor page.

Page 4. Very Poor: The results for very poor households are calculated on this sheet, again using the problem specified on the poor page[9].

Page 5. Food: This page contains 4 graphs illustrating food access for very poor, poor, middle and rich households in the reference (or baseline) year and the current year.

Page 6. Income: A similar set of graphics illustrating differences in income between the baseline and current years.

Page 7. Expenditure: A third set of graphics showing patterns of expenditure in the baseline and current years.

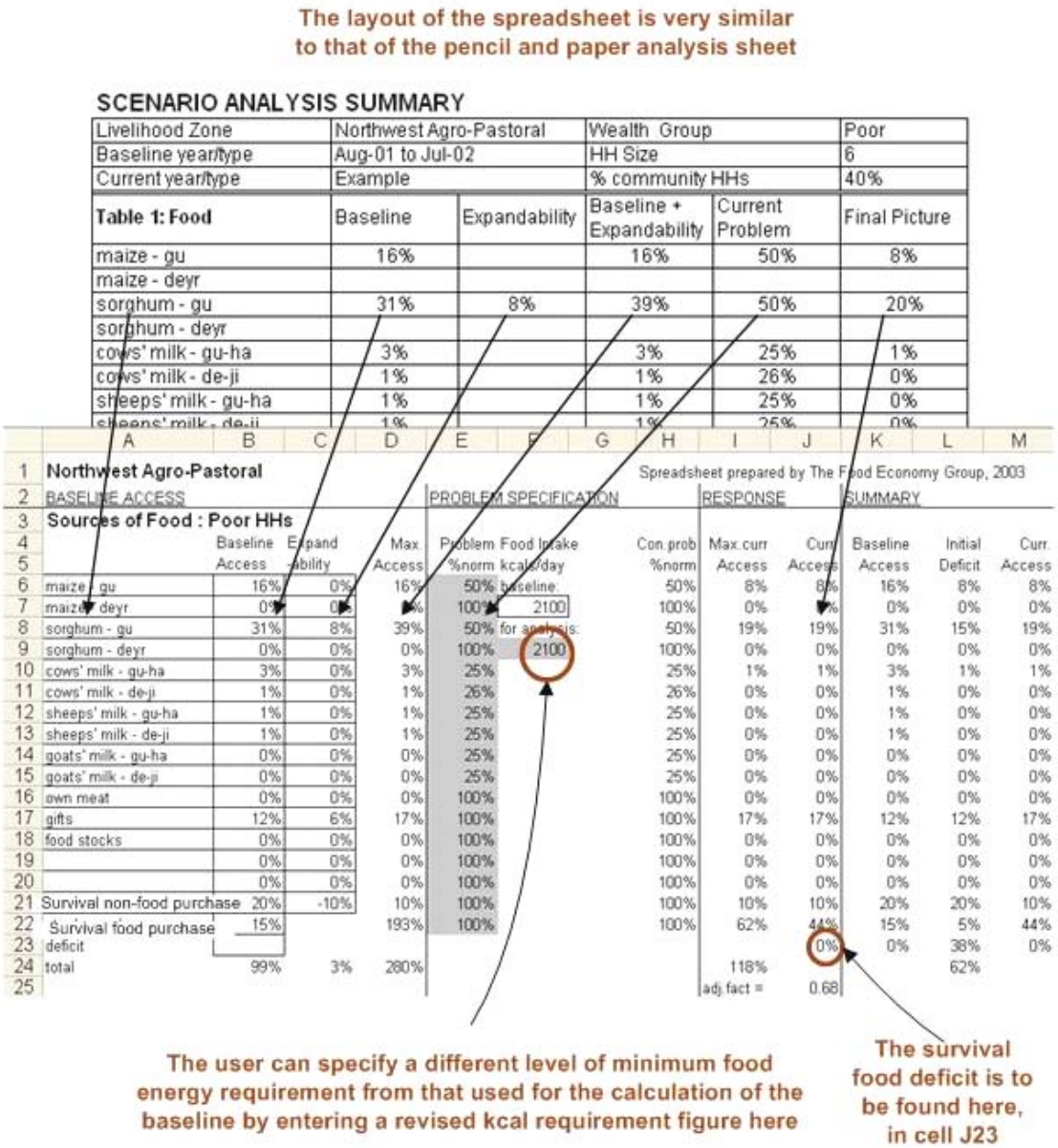
The layout of the first four pages is very similar to the pencil and paper layout described in the previous section. The two examples presented in the last section are re-analysed here using the single zone spreadsheets, so that the layout and results can be compared[10].

[8] For a more comprehensive introduction to the single zone spreadsheet, see 'The Food Economy Spreadsheet – a Training Manual', available from F.E.G

[9] Note: the sheet for the very poor is set as sheet 4 rather than sheet 1 because a very poor group may not be defined for all livelihood zones. There is, on the other hand, a poor group in all livelihood zones.

The single zone spreadsheet is divided horizontally into three sections; from top to bottom: **sources of food**, **income** and **expenditure**; and vertically into four sections, from left to right: **baseline access**, **problem specification**, **response** and **summary**. The response section is equivalent to the 'final picture' column of the pencil and paper analysis. The summary section groups together data on baseline access, the initial deficit (defined below) and current access.

The food section of the spreadsheet



[10] There are minor differences between the results of the pencil and paper and single zone spreadsheet analyses. These are due to the rounding of results in the pencil and paper analysis.

The cash income and expenditure sections of the spreadsheet

Table 2: Income (cash)	Baseline	Expandability	Baseline + Expandability	Current Problem	Final Picture
sorghum sales - gu	70	-70		75%	0
sorghum sales - deyr					
other cashcrop				75%	
cows' milk sales - Gu-Ha	215		215	39%	84
cows' milk sales - De-Ji	84		84	40%	34
cows' ghee/butter sales					

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Northwest Agro-Pastoral**											Spreadsheet prepared by The Food Economy Group, 2003	
2	BASELINE ACCESS				PROBLEM SPECIFICATION				RESPONSE		SUMMARY		
27		Baseline	Expand	Max.	Problem	Comm.	Staple	Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
28	Cash	Access	-ability	Access	%norm	Price	Price	%norm	Access	Access	Access	Deficit	Access
29	sorghum sales - gu	70	-70	0	50%	150%	199%	75%	0	0	4%	3%	0%
30	sorghum sales - deyr	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
31	other cashcrop	0	0	0	50%	150%	199%	75%	0	0	0%	0%	0%
32	cows' milk sales - Gu-Ha	215	0	215	25%	155%	199%	39%	83	83	12%	5%	5%
33	cows' milk sales - De-Ji	84	0	84	26%	155%	199%	40%	34	34	5%	2%	2%
34	cows' ghee/butter sales	0	0	0	25%	155%	199%	39%	0	0	0%	0%	0%
35	sheep's ghee/butter sales	0	0	0	25%	155%	199%	39%	0	0	0%	0%	0%
36	cattle sales - export	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
37	cattle sales - local	150	150	300	50%	48%	199%	24%	72	72	8%	2%	4%
38	goat sales - export	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
39	goat sales - local	100	50	150	50%	48%	199%	24%	36	36	6%	1%	2%
40	ag.labour - gu	600	0	600	75%	100%	199%	75%	450	450	33%	25%	25%
41	ag.labour - deyr	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
42	remittances	150	75	225	100%	100%	199%	100%	225	225	8%	8%	12%
43	charcoal	448	0	448	100%	100%	199%	100%	448	448	25%	25%	25%
44	gifts/social support	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
45	loans	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
46		0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
47		0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
48		0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
49		0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
50		0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
51		0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
52	total:	1,817	205	2,022					1,348	1,348	100%	70%	74%
53													
54	**Expenditure : Poor HHs**										% of baseline expenditure		
55		Baseline			Problem	Comm.		Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
56	Cash	Expend			%norm	Price		%norm	Expend	Expend	Expend	Deficit	Expend
57	Survival non-food	148			100%	100%		100%	148	148	8%	8%	8%
58	l/hood. prot.	952			100%	100%		100%	0	352	52%	35%	19%
59	Survival food	145							1,200	848	8%	5%	47%
60	other	571							0	0	31%	21%	0%
61	total:	1,817							1,348	1,348	100%	70%	74%
62	l/h. prot. deficit								952	600		-17%	-33%
63	Cost of staple												
64	name of staple	sorghum											
65	kg pppd	0.59											
66	HH size	6											
67	cost per kg	0.75											
68	cost of staple	972						199%	1,934				

The livelihoods protection deficit is to be found here, in cell J62

Table 3: Expenditure (cash)	Baseline		Current Problem	Final Picture
Survival non-food	148		100%	148
Livelihoods protection	952		100%	350
Survival food	145			851
Other	571			0
Total	1,817			1349
Deficit				602

Table 4:	Survival food purchase	Cost of 100% kcals: baseline cost	Price problem	current cost	cash available	%kcals
sorghum		972	199%	1934	1201	62%

Data on baseline access and expandability are entered into columns B and C of the spreadsheet (the cells with a single black outline). These data are read automatically from the corresponding baseline storage sheets. The problem specification is entered into the shaded cells (columns E, F and G).

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Northwest Agro-Pastoral**							Spreadsheet prepared by The Food Economy Group, 2003					
2	BASELINE ACCESS				PROBLEM SPECIFICATION				RESPONSE		SUMMARY		
3	**Sources of Food : Poor HHs**												
4		Baseline	Expand	Max.	Problem	Food Intake		Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
5		Access	-ability	Access	%norm	kcals/day		%norm	Access	Access	Access	Deficit	Access
6	maize - gu	16%	0%	16%	50%	baseline:		50%	8%	8%	16%	8%	8%
7	maize - deyr	0%	0%	0%	100%	2100		100%	0%	0%	0%	0%	0%

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Northwest Agro-Pastoral**							Spreadsheet prepared by The Food Economy Group, 2003					
2	BASELINE ACCESS				PROBLEM SPECIFICATION				RESPONSE		SUMMARY		
26	**Income : Poor HHs**										% of baseline income		
27		Baseline	Expand	Max.	Problem	Comm.	Staple	Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
28	Cash	Access	-ability	Access	%norm	Price	Price	%norm	Access	Access	Access	Deficit	Access
29	sorghum sales - gu	70	-70	0	50%	150%	199%	75%	0	0	4%	3%	0%
30	sorghum sales - deyr	0	0	0	100%	100%	199%	100%	0	0	0%	0%	0%
31	other cashcrop	0	0	0	50%	150%	199%	75%	0	0	0%	0%	0%

The two components of the income problem (quantity and price) are entered separately in columns E and F, and the price problem for staple food purchase is entered into the one shaded cell in column G.

All except the grey-shaded cells are locked on the single zone spreadsheets, so as to prevent accidental erasure of a cell formula or any of the cell contents. The information in these grey-shaded cells can easily be changed to look at various scenarios (e.g. different levels of crop production or different levels of price change).

The various columns in the spreadsheet contain the following information:

(B) Baseline Access: Food, cash income and expenditure in the reference year, derived from the baseline assessment. Food is expressed as a percentage of total household food needs (based on a per capita requirement of 2,100 kcals/day). Cash income and expenditure are expressed in thousands of Somaliland shillings per year.

(C) Expandability: The extent to which each food or cash income source can be expanded, expressed either in food or cash terms.

(D) Maximum Access: The sum of Baseline Access + Expandability.

(E) Problem (%normal):Access to each source of food or cash income in the current year, expressed as a % of baseline access (the quantity problem).

(F) Commodity Price: The % of the reference price at which the product (livestock, labour etc.) is sold in the current year (the price problem).

(G) Staple Price: The % of the reference price at which staple food is purchased in the current year (the staple price problem). (This is the same as 'survival food'.)

(H) Consolidated Problem (%normal): The final problem specification, calculated for cash income as the product of the quantity and price problems. Also takes into account any change in the survival food requirement specified in cell F9.

(I) Maximum Current Access: The product of Maximum Access x Consolidated Problem

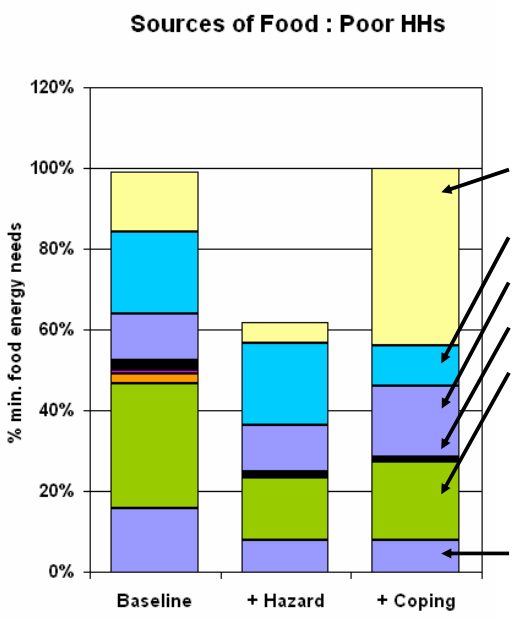
(J) Current Access: The final result, after taking into consideration the expansion of different sources of food and cash income. Where totalling maximum current *food* access gives a figure of less than 100%, current access is equal to maximum current access. Where totalling maximum *food* current access gives a figure of more than 100%, the assumption is made, for the purposes of calculating current food access, that households will not consume more than 100% of food needs, and the expansion of the various food and cash income sources is scaled down accordingly.

(L) Initial Deficit: This indicates the effect of the current problem on Baseline Access, before the expansion of any food or income source. It is calculated as the product of Baseline Access x Consolidated Problem.

The graphics pages

There are three graphics pages, one each for food, income and expenditure. The graphs on these pages allow the user to easily and rapidly follow the steps in the analysis, beginning with the baseline year, plus the hazard, plus coping. The three graphs presented here show the results for poor households from the North-West agro-pastoral example.

Food: The graphic shows the importance of own sorghum and maize production, purchase and gifts for poor households in the baseline year. By comparing the 'baseline' and '+ Hazrd' graphs the user can see the effects of the hazard before any of the coping strategies begin to take effect. The main effects of the hazard are to reduce access to food from own crops and to greatly reduce staple food purchasing power (due to the reduction in cash income and the increase in staple prices – see below). By comparing the '+ Hazard' and '+ Coping' graphs the user can see the effects of the various coping strategies (i.e. the effect of expandability). The main strategy is to increase staple food purchase (as cash income is expanded and expenditure is switched from other items towards staple food – see below). Other responses include an increase in gifts and a switch from selling to consuming sorghum.



Purchase: increased compared to 'baseline'.

Non-staple purchase: reduced compared to 'baseline' as expenditure is switched to cheaper staple food.

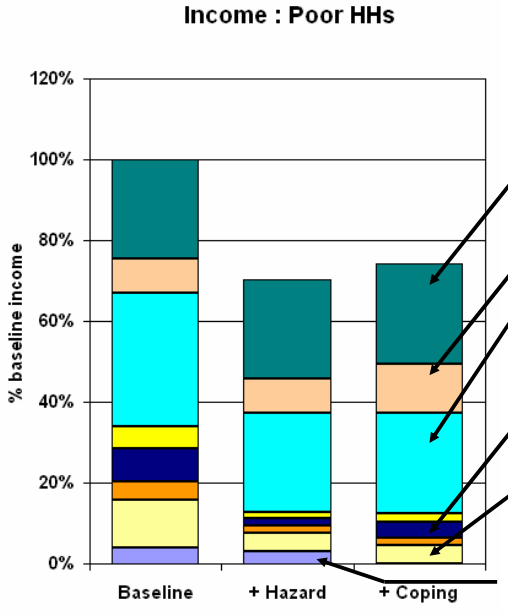
Gifts: increased compared to 'baseline'.

Milk: greatly reduced compared to 'baseline'.

Sorghum – Gu: decreased compared to 'baseline'. The decrease from 'baseline' to '+ hazard' shows the effect of crop failure before any switching from sales to consumption. The increase from '+ hazard' to '+ coping' represents the effect of switching from selling to consumption.

Maize – Gu: decreased compared to 'baseline'

Income: The three most important sources of cash income for poor households from the North-West agro-pastoral LZ are agricultural labour, sale of charcoal and sale of cows' milk. The effect of the hazard is to reduce cash income from agricultural labour (due to crop failure and the loss of harvest labour) and from the sale of milk (due to reduced production). The poor have relatively little ability to expand cash income – there is some increase in remittances and some increase in livestock sales, but these are relatively minor.



Charcoal: No change in total cash income compared to 'baseline'.

Remittances: Increased compared to 'baseline'.

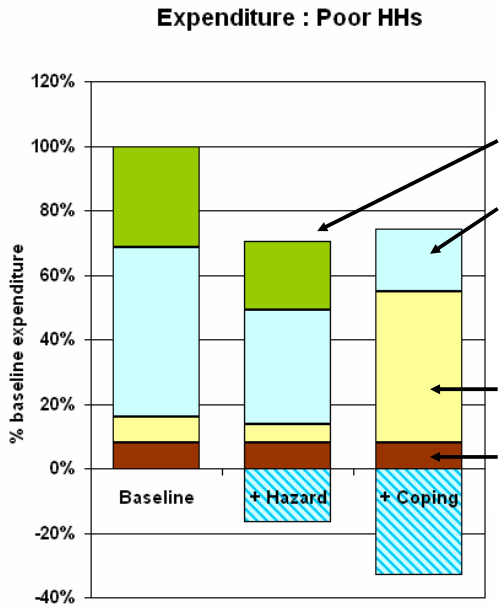
Ag. Labour: Decreased compared to 'baseline' due to loss of harvest labour.

Livestock sales: reduced compared to 'baseline'. There is a small increase from '+ hazard' to '+ coping' due to increased sales but there is little scope for expanding livestock sales among the poor.

Milk sales: greatly reduced compared to 'baseline'.

Sorghum sales: decreased compared to 'baseline'. The decrease from '+ hazard' to '+ coping' represents the effect of switching from sale to consumption.

Expenditure: In the baseline year, expenditure is divided between four categories; minimum non-food, staple, livelihoods protection and other. In the current year, total expenditure falls in line with total income, and – provided cash is switched to staple purchase – there is a significant livelihoods protection deficit.



Other: Reduced to zero as cash is switched to the purchase of essential non-food items and staple food.

Livelihoods Protection Expenditure: If cash is reserved for staple purchase there is insufficient income to purchase the whole of the livelihoods protection expenditure basket. This is indicated by the livelihoods protection deficit (i.e. the blue bar beneath the 'x'-axis).

Survival food purchase: Switching of expenditure to staple purchase is potentially an important coping strategy.

Survival non-food: Kept constant as this is represents obligatory expenditure on items such as salt and soap.

The Guban Pastoral Example

This is reproduced below, for comparison with the pencil and paper analysis presented in the last section. The figures in the 'maximum current access' column are very similar to those in the 'final picture' column of the pencil and paper analysis.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Guban Pastoral**								Spreadsheet prepared by The Food Economy Group, 2003				
2	BASELINE ACCESS				PROBLEM SPECIFICATION				RESPONSE		SUMMARY		
3	**Sources of Food : Poor HHs**												
4		Baseline	Expand	Max.	Problem	Food Intake		Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
5		Access	-ability	Access	%norm	kcals/day		%norm	Access	Access	Access	Deficit	Access
6	camels' milk - gu-ha	5%	0%	5%	27%	baseline:		27%	1%	1%	5%	1%	1%
7	camels' milk - de-ji	2%	0%	2%	25%	2100		25%	1%	1%	2%	1%	1%
8	sheeps' milk - gu-ha	1%	0%	1%	20%	for analysis:		20%	0%	0%	1%	0%	0%
9	sheeps' milk - de-ji	0%	0%	0%	20%	2100		20%	0%	0%	0%	0%	0%
10	goats' milk - gu-ha	1%	0%	1%	20%			20%	0%	0%	1%	0%	0%
11	goats' milk - de-ji	1%	0%	1%	20%			20%	0%	0%	1%	0%	0%
12	own meat	3%	0%	3%	100%			100%	3%	3%	3%	3%	3%
13	gifts	15%	8%	23%	100%			100%	23%	23%	15%	15%	23%
14		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
15		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
16		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
17		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
18		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
19		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
20		0%	0%	0%	100%			100%	0%	0%	0%	0%	0%
21	non-staple purchase	35%	-18%	18%	100%			100%	18%	18%	35%	35%	18%
22	staple purchase	40%		110%	100%			100%	37%	37%	40%	12%	37%
23	deficit									17%	0%	33%	17%
24	total	103%	-10%	163%					83%			67%	
25									adj.fact =	2.09			
26	**Income : Poor HHs**										% of baseline income		
27		Baseline	Expand	Max.	Problem	Comm.	Staple	Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
28	Cash	Access	-ability	Access	%norm	Price	Price	%norm	Access	Access	Access	Deficit	Access
29	camels' milk sales - Gu-Ha	156	0	156	27%	155%	148%	42%	65	65	10%	4%	4%
30	camels' milk sales - De-Ji	96	0	96	25%	155%	148%	39%	37	37	6%	2%	2%
31	goats' milk sales - Gu-Ha	120	0	120	20%	155%	148%	31%	37	37	8%	2%	2%
32	goats' milk sales - De-Ji	60	0	60	20%	155%	148%	31%	19	19	4%	1%	1%
33	skins	12	0	12	100%	100%	148%	100%	12	12	1%	1%	1%
34	goat sales - export	0	0	0	41%	48%	148%	20%	0	0	0%	0%	0%
35	goat sales - local	80	0	80	41%	48%	148%	20%	16	16	5%	1%	1%
36	sheep sales - export	0	0	0	41%	48%	148%	20%	0	0	0%	0%	0%
37	sheep sales - local	640	0	640	41%	48%	148%	20%	126	126	41%	8%	8%
38	remittances	0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
39	gifts: goats to sell	400	200	600	100%	100%	148%	100%	600	600	26%	26%	38%
40	loans	0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
41		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
42		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
43		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
44		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
45		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
46		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
47		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
48		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
49		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
50		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
51		0	0	0	100%	100%	148%	100%	0	0	0%	0%	0%
52	total:	1,564	200	1,764					912	912	100%	46%	58%
53													

54	**Expenditure : Poor HHs**								% of baseline expenditure		
55		Baseline	Problem	Comm.		Con.prob	Max.curr	Curr.	Baseline	Initial	Curr.
56	Cash	Expend	%norm	Price		%norm	Expend	Expend	Expend	Deficit	Expend
57	min.non-food	50	100%	100%		100%	50	50	3%	3%	3%
58	l/hood. prot.	490	100%	100%		100%	0	0	31%	14%	0%
59	staple	624					862	862	40%	17%	55%
60	other	400						0	26%	11%	0%
61	total:	1,564					912	912	100%	46%	58%
62	l/h. prot. deficit						490	490		-18%	-31%
63	Cost of staple										
64	name of staple	rice									
65	kg pppd	0.59									
66	HH size	6									
67	cost per kg	1.20									
68	cost of staple	1,559				148%	2,313				
69											
70	Exchange rate ($1 = amount of local currency)										
71											
72											

Calculating Assistance Requirements

The outputs from the single zone spreadsheet are estimates of the survival and livelihoods protection deficits faced by each wealth group in each livelihood zone. The results for the Borama district example are summarised below.

Box 21. Summary results for Borama District

	North-West agro-pastoral LZ		*Guban pastoral LZ*	
Wealth group	**Survival deficit (%kcals)**	**Livelihoods protection deficit ('000 SlSh per household)**	**Survival deficit (%kcals)**	**Livelihoods protection deficit ('000 SlSh per household)**
Poor	0%	600	17%	490
Middle	0%	1290	36%	728
Rich	0%	0	9%	898

The next step is to translate these deficits into meaningful numbers of beneficiaries and amounts of assistance at district level. This is done using a further spreadsheet, the assistance calculation sheet. A completed copy containing the example results may be found in the *\Som_ex* directory (assistance calculation sheet.xls). This is reproduced below and the various steps in the calculation explained.

The sheet is set up to generate results for a single district containing up to three livelihood zones. The data entry cells in the spreadsheet are shaded either green or yellow. Data need be entered into the green cells once only, when the assistance calculation sheet is first set up for a new district. These cells contain data on population, household size and the wealth breakdown. Results from the current analysis (i.e. the food and livelihoods protection deficits, and a title for the current analysis) are entered into the yellow cells for each new analysis. Protecting the sheet (see notes on protection at the end of this section) prevents data entry into all except the yellow cells.

	A	B	C	D	E	F	G	H	I	J	K
1	**WORKSHEET FOR TRANSLATING DEFICITS INTO BENEFICIARY NUMBERS AND FOOD/CASH REQUIREMENTS**										
2											
3	**DISTRICT**		**Boroma example**								
4											
5	**POPULATION AND WEALTH BREAKDOWN**										
6											
7	**DISTRICT RURAL POPULATION BY LZ**						**LZ CODES AND NAMES**				
8			LZ				NWA	North-West Agro-Pastoral			
9			NWA	GUP			GUP	Guban Pastoral			
10	Total	132,156	66,078	66,078							
11											
12	**WEALTH BREAKDOWN BY LZ**										
13	**Calculate the % population in each wealth group from % households in each wealth group**										
14			LZ								
15			NWA			GUP					
16	**% Households**		a: %HHs	b:HH size	c: a) x b)	a: %HHs	b:HH size	c: a) x b)	a: %HHs	b:HH size	c: a) x b)
17	V.Poor	p:			0			0			0
18	Poor	q:	40%	6	240	25%	6	150			0
19	Middle	r:	35%	7	245	55%	8	440			0
20	Rich	s:	25%	9	225	20%	11	220			0
21	Total		100%		710	100%		810	0%		0
22	Multiply %HHs x HH size and enter result in col c. Use figures in col c to calculate % population.										
23	%popn in very poor group = p ÷ total x 100					%popn in middle group = r ÷ total x 100					
24	%popn in poor group = q ÷ total x 100					%popn in better-off group = s ÷ total x 100					

Data on district population by LZ, and wealth breakdown and household size data for each LZ are entered into this first section of the spreadsheet. Since the wealth breakdown is expressed in terms of percentage of households in each wealth group, a calculation is required to convert these results into percentage of the population. The details of the calculation are explained in rows 22 to 24 of the spreadsheet. The %population figures are then used to prepare a breakdown of the district population by LZ and wealth group.

	A	B	C	D	E	F
25						
26			LZ			
27	**% Population**		NWA	GUP	0	
28	V.Poor		0%	0%	0%	
29	Poor		34%	19%	0%	
30	Middle		35%	54%	0%	
31	Rich		32%	27%	0%	
32	Total		100%	100%	0%	
33						
34	**DISTRICT RURAL POPULATION BY LZ**					
35	**Calculate the district rural population by wealth group**					
36			LZ			
37			NWA	GUP	0	
38	V.Poor		0	0	0	
39	Poor		22,336	12,237	0	
40	Middle		22,802	35,894	0	
41	Rich		20,940	17,947	0	
42	Total		66,078	66,078	0	
43	Enter LZ popn in the total row, and calculate the popn of each wealth group as total x %popn in WG ÷ 100					

The remaining calculations are performed in a series of steps that are explained within the spreadsheet.

Steps 1 and 2 deal with the number of people facing a deficit (i.e. the number of beneficiaries).

SURVIVAL DEFICIT

Step 1: Enter results from outcome analysis

A. ESTIMATED SURVIVAL DEFICIT BY WEALTH GROUP

% Food Needs		LZ		
		NWA	GUP	0
	V.Poor			
	Poor	0%	17%	
	Middle	0%	36%	
	Rich	0%	9%	

B. ESTIMATED RURAL POPULATION FACING A SURVIVAL DEFICIT, BY LZ

		LZ		
		NWA	GUP	0
	V.Poor	0	0	0
	Poor	0	12,237	0
	Middle	0	35,894	0
	Rich	0	17,947	0
Total		0	66,078	0
District total		**66,078**	**beneficiaries**	

LIVELIHOODS PROTECTION DEFICIT

E. ESTIMATED LIVELIHOODS PROTECTION DEFICIT BY WEALTH GROUP

'000 SS per household		LZ		
		NWA	GUP	0
	V.Poor			
	Poor	600	490	
	Middle	1,290	728	
	Rich	0	898	

F. ESTIMATED RURAL POPULATION FACING A LIVELIHOODS PROTECTION DEFICIT, BY LZ

		LZ		
		NWA	GUP	0
	V.Poor	0	0	0
	Poor	22,336	12,237	0
	Middle	22,802	35,894	0
	Rich	0	17,947	0
Total		45,138	66,078	0
District total		**111,216**	**beneficiaries**	

Step 3 deals with the amount of food required to fill the survival deficit and the amount of cash to fill the livelihoods protection deficit.

Step 3a: Calculate the food required to fill the survival deficit

= % deficit ÷ 100 (Table A)
x population facing a deficit (Table B)
x ration level (Table C) x 365 days
÷ 1000 (to convert to MT)

C. TONS REQUIRED TO FILL SURVIVAL DEFICIT IN TABLE B

ration level (kg grain pppd) =			0.58	
		LZ		
		NWA	GUP	0
	V.Poor	0	0	0
	Poor	0	440	0
	Middle	0	2,736	0
	Rich	0	342	0
Total		0	3,518	0
District total		**3,518**	**MT grain**	

Step 3b: Calculate the cash required to fill the livelihoods protection deficit

= deficit per household (Table E)
x population facing a deficit (Table F)
÷ no.people per household (Table G)
÷ 1000 (to convert to '000,000 SS)

G. HOUSEHOLD SIZE, BY LZ AND WEALTH

		LZ		
		NWA	GUP	0
V.Poor		0	0	0
Poor		6	6	0
Middle		7	8	0
Rich		9	11	0

H. CASH OR CASH EQUIVALENT REQUIRED TO FILL LIVELIHOODS PROTECTION DEFICIT IN TABLE B, in '000,000s

		LZ		
		NWA	GUP	0
	V.Poor	0	0	0
	Poor	2,234	999	0
	Middle	4,202	3,266	0
	Rich	0	1,465	0
Total		6,436	5,731	0
District total		**12,166**	**SS ('000,000)**	

Since cash is also a potential means of filling a survival deficit (and food can be used to fill a livelihoods protection deficit), two further calculations are completed at **Step 4,** to estimate the amount of cash required to fill the survival deficit, and the amount of food to fill the livelihoods protection deficit.

	A	B	C	D	E	F	G	H	I	J	K
93	**Step 4a: Calculate the cash required ('000,000 SS) to fill the survival deficit**						**Step 4b: Calculate the food required to fill the livelihoods protection deficit**				
94	= tons food (Table C) x 1000 (to convert to kg)						= cash required (Table H) x 1,000,000				
95	x price per kg (Table D)						÷ price per kg (Table I) ÷ 1000 (to convert MT)				
96	÷ 1,000,000 (to convert to '000,000 SS)										
97	(Note: Look up the current year price of staple in the outcome analysis spreadsheet)										
98											
99	**D. CASH OR CASH EQUIVALENT REQUIRED TO FILL SURVIVAL DEFICIT IN TABLE C, in '000s**						**LIVELIHOODS PROTECTION DEFICIT IN TABLE G**				
100			LZ						LZ		
101	est. cost of staple,		NWA	GUP	0		est. cost of staple,		NWA	GUP	0
102	SS ('000)/kg (curr.yea		2800	2800	2800		SS ('000)/kg (curr.yea		2800	2800	2800
103		V.Poor	0	0	0			V.Poor	0	0	0
104		Poor	0	1,233	0			Poor	798	357	0
105		Middle	0	7,660	0			Middle	1,501	1,167	0
106		Rich	0	957	0			Rich	0	523	0
107	Total		0	9,850	0		Total		2,298	2,047	0
108	**District total**		**9,850**	**SS ('000,000)**			**District total**		**4,345**	**MT grain**	
109											

A summary of district results is provided at the bottom of the sheet, together with a set of notes on types of intervention, reproduced below.

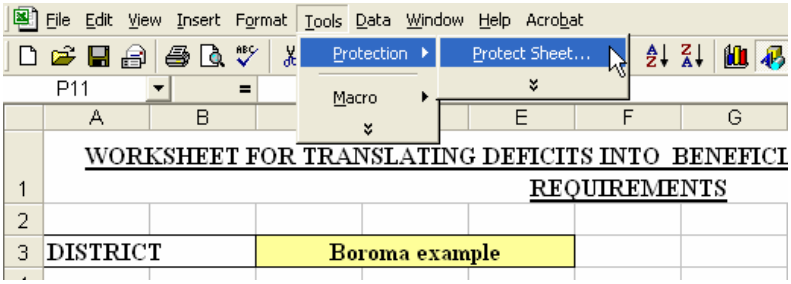
110	**DISTRICT SUMMARY**							
111		Survival deficit		Livelihoods protection deficit		Total		
112	**No. Beneficiaries**		66,078		111,216		111,216	
113	**Assistance Requirements**							
114	**Food** required to fill deficit (MT)	MT	3,518	MT	4,345	MT	7,863	
115	**OR Cash required to fill deficit ('000,000 SS)**	OR SS	9,850	OR SS	12,166	OR SS	22,017	
116	Note:							
117	A survival deficit can be filled by either food or cash (provided the distribution of cash will not cause local inflation and will encourage the import of food into the district at reasonable prices).							
118	A survival deficit could also be filled by a market intervention that reduces market prices.							
119	A cash deficit can be filled with cash or by the distribution of items that will release money for essential non-food expenditures. These items could include inputs such as fertilizer, contributions to the cost of health care and/or education. Food distribution can also be used to fill a livelihoods protection deficit, since this will reduce households' need to purchase staple food, releasing money to be spent on non-food items.							
120	Beneficiaries with a survival deficit also face a livelihoods protection deficit, so the total number of beneficiaries is equal to the number facing a livelihoods protection deficit							
121								
122	Format Design: USAID FEWS NET Project, 2005							

How to protect the worksheet:

- Select Tools from the menu bar
- Select Protection[1]
- Select Protect Sheet

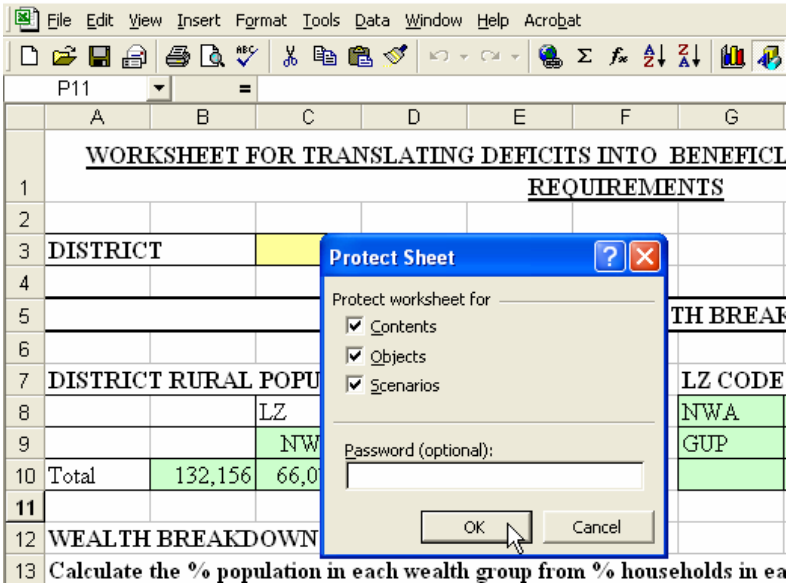
The Protect Sheet dialogue box will appear.

- Click OK to protect the sheet.



How to unprotect the worksheet:

- Select Tools from the menu bar
- Select Protection[1]
- Select Unprotect sheet



Note:

[1] If the sheet is unprotected, the Protect Sheet option is displayed, otherwise the Unprotect Sheet option is displayed.

OUTCOME ANALYSIS – INTEGRATED SPREADSHEET

Introduction

The single zone spreadsheets are designed for the analysis of a single district or livelihood zone. They are therefore most useful when analysing a localised problem affecting a small number of districts/zones. However, the analysis becomes unmanageable if an attempt is made to scale up to sub-national or national level using the single zone spreadsheets and the integrated spreadsheet has been developed for this purpose.

The integrated spreadsheet has a number of significant advantages over the single zone spreadsheet, detailed below. Most importantly, it provides a user-friendly link between existing monitoring data, gathered by administrative unit, and baseline information, which applies to livelihood zone boundaries. This makes it possible for in-country analysts to use the livelihood baselines on a regular basis for outcome analysis. Specifically, the integrated spreadsheet enables the following:

- Sub-national or national level analysis can be undertaken within a single spreadsheet
- The integrated spreadsheet accepts basic data on district level crop production and market prices and uses these data to calculate the 'problem'. This is in contrast to the single zone spreadsheet, where the user has to calculate the problem before entering it into the spreadsheet.
- The integrated spreadsheet accepts data by district (or by market in the case of market prices), and generates output by district.
- The integrated spreadsheet generates estimates of the number of people facing a deficit, by district, and the overall assistance requirements, again by district. These are the primary outputs required by decision-makers.

Scaling up HEA

The integrated spreadsheet links – in a user-friendly way - existing monitoring data, gathered by district, to baseline information, gathered by livelihood zone.

The basic **input** into the integrated spreadsheet consists of data that help define current access to food and non-food goods and services, such as data on crop production (entered by district) and prices of key commodities (entered by market). This is the type of data that most government monitoring systems already gather (or are supposed to gather) and very little additional training is required to input this information into the integrated spreadsheet.

The primary **outputs** are estimates of the numbers of beneficiaries facing food and livelihoods protection deficits, by district and livelihood zone, and of the amounts of food and cash assistance required to address these deficits – given current crop production levels, market prices, etc, and taking into account underlying livelihood patterns. These data can be used in a number of ways:

- to indicate the areas of greatest need;
- to calculate the number of people requiring assistance in each district and livelihood zone;
- to calculate the total food or expenditure gap and therefore food aid or cash needs, or;
- to identify areas where further follow-up and field work are required.

Two versions of the integrated spreadsheet (IS) are available, one for agricultural areas and one for agro-pastoral and pastoral areas. This section describes the agro-pastoral/pastoral IS. The structure of the two integrated spreadsheets is very similar, the only differences

being a) that the agricultural spreadsheet has more space for crops and b) the agro-pastoral/pastoral sheet has more space for livestock (i.e. it can accommodate more types of livestock and more livestock products).

The integrated spreadsheet (IS) has a maximum capacity of up to 20 districts and 12 livelihood zones. There are 8 separate sheets:

Table 10. Integrated Spreadsheet contents

Sheet	*Contents*
B (baselines)	The baseline data
	The calculations of maximum current access (i.e. it does the job of the single zone spreadsheet but for up to 20 districts X 12 LZs
P (population)	data on population by LZ and district
	wealth breakdown and household size information by LZ and district
	An exchange rate table (only required if more than one currency is used within the area covered by the IS)
C (crops)	This is where the user enters data on current crop production. The sheet contains the reference year data required to specify the current crop production problem, and performs the calculations.
L (livestock)	This is where the user enters data on current livestock production. The sheet contains the reference year data required to specify the current livestock production problem, and performs the calculations.
M (markets)	This is where the user enters data on current market prices. The sheet contains the reference year data required to specify current year market price problems, and performs the required calculations.
O (other)	space to specify a problem of access to other sources of food and income (e.g. quantity of gifts, labour etc.)
	space to enter other basic parameters for the analysis (e.g. to exclude certain types of coping strategy from the analysis)
R (results)	Contains a summary of results, by district and livelihood zone.
G (graphics)	Allows the user to plot graphs for selected districts, livelihood zones and wealth groups.

An example integrated spreadsheet containing data for two neighbouring districts, Boroma and Baki, is provided in the *\Som_ex* directory of the CD. This spreadsheet is described in further detail below.

Running a 'Problem'

This section of the guide takes the user through the procedure for running a 'problem', using the same example as elsewhere in this guide. The only difference is the addition of a second district, Baki, which also contains the two example livelihood zones, NWA and GUP. The problem entered for Baki is the same as that for Boroma. The sheets that are used to 'run' the problem are listed in the table to the right. These sheets will now be described in detail. The contents of the remaining sheets (the baselines and populations pages) are described later in this section.

Shading of the cells in the spreadsheet

Cells in the spreadsheet are shaded yellow, green or blue, or are left unshaded. Yellow and green cells are the cells into which the user enters data. Blue shading signals a cross-check for the user to examine. Un-shaded cells contain text, formulae or are blank.

Sheets Used to Run a 'Problem'

To run a 'problem' the user enters data to define the problem into the following sheets:	The results of the analysis can be found in:
Sheet C – Crops	**Sheet R – Results tables**
Sheet L – Livestock	**Sheet G – Graphics**
Sheet M – Markets	
Sheet O – Other	

Data for the current problem (e.g. current crop production, current prices) are entered into the yellow-shaded cells. These are the only cells that the user needs to fill when running a current problem. If a yellow cell is left blank, the default for problem specification is always 100%.

The green shaded cells need to be filled once only, when the spreadsheet is first set up. These cells contain the reference year monitoring data used to calculate the current problem, and also basic data such as the names of districts and livelihood zones included in the spreadsheet, the population by district and livelihood zone, etc. Once data have been entered into these cells, the spreadsheet should be protected (i.e. locked) to prevent any of the data in these cells being accidentally erased (see page 57 for how to protect a spreadsheet). Once the spreadsheet has been protected, the only cells into which the user can enter data are the yellow cells.

Entering the crop production problem (Sheet C)

The agro-pastoral/pastoral IS has space to enter 10 crops, arranged one below the other on sheet C. For each crop there are three tables:

a) A table in which to enter current year crop production (cols A to F)
b) A table showing the problem specification by district and LZ (cols H to S)
c) A table containing crop production data for the reference year (cols U to AI).

Crops included in the Somalia IS:
1. maize - gu
2. maize - de
3. sorghum - gu
4. sorghum - de
5. cowpeas - gu
6. cowpeas - de
7. sesame
8. groundnuts
9. fruit/veg - gu
10. fruit/veg - de

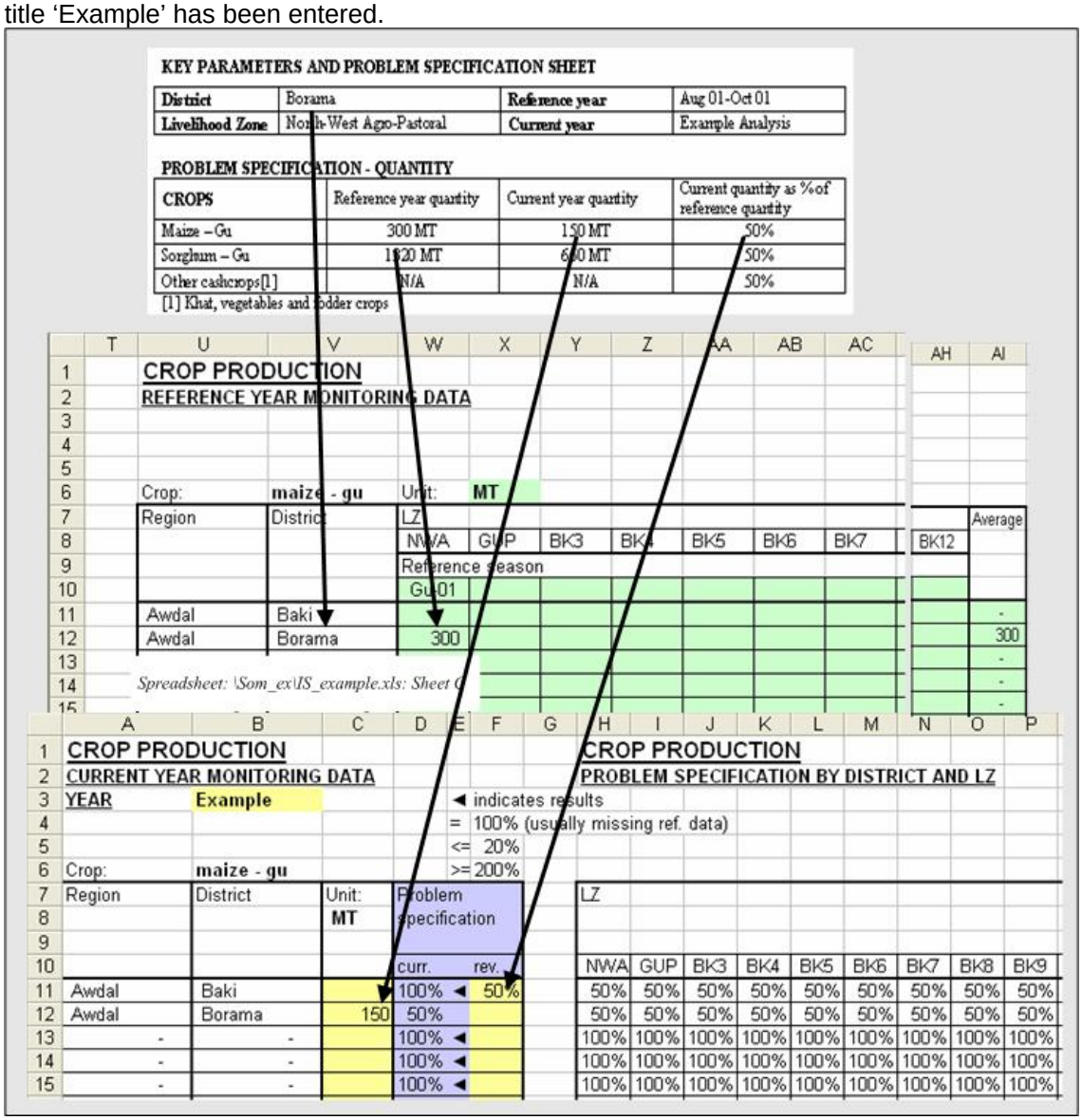
These three tables are reproduced below for the first of the crops in the example IS – *gu* season maize - together with part of the corresponding key parameter and problem specification sheet, showing the relationship between the two.

Beginning with the reference year production table, the following information is to be found within the green-shaded cells:

1. the unit of measurement (MT in the example)
2. the title of the reference season for each livelihood zone (Gu-01 for NWA)
3. district crop production in the reference season (300 MT for Boroma in Gu-01)

There is also a column for average production for the district (col AI), which in the example is set to reference year production for NWA, i.e. 300 MT[11].

Returning now to the top left-hand corner of sheet C, the first of the yellow cells to fill is B3, the title for the current analysis. Usually this will be a year (e.g. 2005-06), but in this case the title 'Example' has been entered.



KEY PARAMETERS AND PROBLEM SPECIFICATION SHEET

District	Borama	**Reference year**	Aug 01-Oct 01
Livelihood Zone	North-West Agro-Pastoral	**Current year**	Example Analysis

PROBLEM SPECIFICATION - QUANTITY

CROPS	Reference year quantity	Current year quantity	Current quantity as %of reference quantity
Maize – Gu	300 MT	150 MT	50%
Sorghum – Gu	1200 MT	600 MT	50%
Other cashcrops[1]	N/A	N/A	50%

[1] Khat, vegetables and fodder crops

CROP PRODUCTION
REFERENCE YEAR MONITORING DATA

Crop: maize - gu Unit: MT

Region	District	LZ								
		NWA	GUP	BK3	BK4	BK5	BK6	BK7	BK12	Average
		Reference season								
		Gu-01								
Awdal	Baki									-
Awdal	Borama	300								300

Spreadsheet: \Som_ex\IS_example.xls: Sheet C

CROP PRODUCTION
CURRENT YEAR MONITORING DATA

YEAR Example

◄ indicates results
= 100% (usually missing ref. data)
<= 20%
>= 200%

Crop: maize - gu

Region	District	Unit: MT	Problem specification		LZ								
			curr.	rev.	NWA	GUP	BK3	BK4	BK5	BK6	BK7	BK8	BK9
Awdal	Baki		100% ◄	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Awdal	Borama	150	50%		50%	50%	50%	50%	50%	50%	50%	50%	50%
-	-		100% ◄		100%	100%	100%	100%	100%	100%	100%	100%	100%
-	-		100% ◄		100%	100%	100%	100%	100%	100%	100%	100%	100%
-	-		100% ◄		100%	100%	100%	100%	100%	100%	100%	100%	100%

CROP PRODUCTION
PROBLEM SPECIFICATION BY DISTRICT AND LZ

The next step is to enter data on current year production into column C (150 MT for Boroma). The spreadsheet then calculates current production as a percentage of reference, returning a result for each district in the blue-shaded cells of column D[12]. This gives the user the chance to review the problem specifications, and, if necessary, override a figure that is

[11] The reference production table is designed so that production can be specified separately for each LZ. This is necessary because the reference year may differ from one baseline to another. The default for calculating 'average' production for the district (col AI) is to take the average of all the reference year data entered into the table for a particular district. However, if any of the reference years are poor, it may be better to enter a long-term average for production into this column.

[12] The figure in the blue-shaded cell is calculated as current production ÷ average production (from col AI). Note however that the problem specification actually used in the outcome analysis is always specific to the LZ and is calculated as current production ÷ reference production for the LZ.

unrealistically high or low[13]. If the user chooses to override the calculated result, this can be done by entering a revised percentage into the second yellow shaded column, col F.

This column can also be used to enter an estimated problem for a district for which there is no data, e.g. Baki in the example (Baki is not included in the annual crop assessment for Somalia, but borders Boroma, and can be assumed to have the same crop production problem as Boroma). This is also the standard method for entering problem specifications for entire crops for which no reference year data are available (e.g. other cashcrops for NWA, which are included under gu season fruit/veg in the IS).

The remaining table (cols H to S) gives the problem specification for each combination of district and livelihood zone. Note that a problem is specified for all livelihood zones and districts, even for combinations of livelihood zone and district that do not exist[14].
Having completed data entry for the first crop, the user simply repeats the procedure for all other crops.

Entering the livestock problem (Sheet L)

The data entry tables in this section of the spreadsheet follow the format for specifying the livestock production problem set out from page 30 onwards, and the reader is advised to review these before proceeding further. At the top of the sheet are three tables that allow livestock holdings to be updated, by district and LZ. There is one table for camels, one for cattle and one for shoats.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1			LIVESTOCK PRODUCTION															
2			CURRENT YEAR MONITORING DATA															
3			YEAR	Example														
4			HERD SIZE BY DISTRICT AND LIVELIHOOD ZONE															
5			1. The table gives reference year herd sizes by district and livelihood zone															
6			2. Enter rev ised herd size in the yellow cells, or leave blank to retain existing herd sizes.															
7			3. Changes in herd size are used to calculate changes in the number of livestock sold and in the number of mature fem															
8			4. Data for poor will be applied to very poor and for middle will be applied to b/off.															
9			Camels															
10			Region	District	Livelihood Zone													
11					NWA				GUP				BK3				BK4	
12					P		M		P		M		P		M		P	
13			Awdal	Baki	0		0		1	0.5	11	5.5						
14			Awdal	Borama	0		0		1	0.5	11	5.5						
15			-	-														
16			-	-														
17			-	-														

Spreadsheet: \Som_ex\IS_example.xls: Sheet L

Part of the table for camels is reproduced above. The average number of camels owned by the poor and middle wealth groups in each livelihood zone is presented in the unshaded (i.e. white) columns, and the user can enter a revised figure (if necessary) into the correponding

[13] Figures that may require checking are indicated by the symbol ◄ in col E. The meaning of this symbol is given at the top of col E. It indicates a result that either a) equals exactly 100% (usually returned if there is no reference data), b) is less than 20% of average or c) greater than 200% of average.

[14] Further notes:

a) if no problem is specified (i.e. cols C and F left blank), the default is to set the problem specification to 100%, i.e. to set access to the same as the reference year.

b) a livelihood-zone specific problem is calculated where possible (=current ÷ reference year production). If no figure is given for reference year production, the problem for that LZ is calculated as current year ÷ average production.

c) If a revised estimate for the problem is entered into col F, the revision is carried across to the calculation for each district/LZ combination, as follows:
revised% / original% x current year prodn / ref year prodn

yellow-shaded cell. Taking our example of middle households in GUP, the reference year figure for camel ownership is 11 and the current year figure is 5.5 for both Baki and Boroma[15].

The corresponding tables for cattle and shoats are reproduced below.

Cattle

Region	District	Livelihood Zone											
		NWA				GUP				BK3			BK4
		P		M		P		M		P		M	P
Awdal	Baki	4	2	8	4	0		0					
Awdal	Borama	4	2	8	4	0		0					
-	-												
-	-												
-	-												

Shoats

Region	District	Livelihood Zone											
		NWA	-			GUP	-			BK3	-		BK4
		P		M		P		M		P		M	P
Awdal	Baki	8	4	30	15	37	15	135	55				
Awdal	Borama	8	4	30	15	37	15	135	55				
-	-												
-	-												
-	-												

The data entered into these tables is used to calculate the herd size 'problem' for each combination of district and livelihood zone. These problem specification tables can be found in columns BB to BZ, and part of the table relating to camel ownership by poor households (signified by P in row 12) is reproduced to the right. This shows a herd size problem of 50% for GUP for the first two districts (i.e. Baki and Boroma), corresponding to the reduction in herd size from 1 to 0.5, (see table above). For all other district-livelihood zone combinations the problem has been set to the default of 100%.

LIVESTOCK PRODUCTION

PROBLEM SPECIFICATION BY DISTRICT AND LZ

HERD SIZE

Camels

Livelihood Zone	NWA	GUP	BK3	BK4	BK5	BK6	BK7	BK8	BK9
P	P	P	P	P	P	P	P	P	P
100%	50%	100%	100%	100%	100%	100%	100%	100%	
100%	50%	100%	100%	100%	100%	100%	100%	100%	
100%	100%	100%	100%	100%	100%	100%	100%	100%	
100%	100%	100%	100%	100%	100%	100%	100%	100%	
100%	100%	100%	100%	100%	100%	100%	100%	100%	

The milk production problem is specified for each type of livestock - see the tables reproduced below. Again, these follow the format set out from page 30 onwards.

MILK PRODUCTION BY DISTRICT

Camels

Region	District	1st season Heys-Gu					2nd season Deyr				
		(A)	(B)	(C)	(D)	prob.	(A)	(B)	(C)	(D)	prob.
Awdal	Baki	40	30	3.5	2.5	54%	40	30	3	2	50%
Awdal	Borama	40	30	3.5	2.5	54%	40	30	3	2	50%
-	-					100%					100%
-	-					100%					100%
-	-					100%					100%

[15] Note that figures for herd size are only given for relevant combinations of district and livelihood zone. E.g. if a third district were included in the IS that did not contain any GUP, then the cells for GUP for that district would be left blank.

113	Cattle														
114	Region	District	1st season Heys-Gu					2nd season Deyr				
115															
116			(A)	(B)	(C)	(D)	prob.	(A)	(B)	(C)	(D)	prob.
117	Awdal	Baki	45	35	2.75	1.75	49%	45	35	2.25	1.5	52%
118	Awdal	Borama	45	35	2.75	1.75	49%	45	35	2.25	1.5	52%
119	-	-					100%					100%
120	-	-					100%					100%
121	-	-					100%					100%

138	Shoats														
139	Region	District	1st season Heys-Gu					2nd season Deyr				
140															
141			(A)	(B)	(C)	(D)	prob.	(A)	(B)	(C)	(D)	prob.
142	Awdal	Baki	45	35	0.4	0.25	49%	45	35	0.4	0.25	49%
143	Awdal	Borama	45	35	0.4	0.25	49%	45	35	0.4	0.25	49%
144	-	-					100%					100%
145	-	-					100%					100%
146	-	-					100%					100%

The milk production problem is calculated as follows, for each district and each season:

Milk production problem = (B ÷ A) x (D ÷ C) x 100, where:

(A) Typical number of milking animals per 100 mature females in the season
(B) Actual number of milking animals per 100 mature females this season
(C) Typical milk yield in the season (litres per day)
(D) Actual milk yield this season

The results are presented in the blue shaded cells of the milk production tables. In the example, the Heys-Gu season camels' milk production problem is 30÷40 x 2.5÷3.5 x 100 = 54%.

	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM
85													
86		MILK PRODUCTION BY LZ AND DISTRICT											
87													
88		Camels	Heys-Gu										
89		Livelihood Zone											
90		NWA	GUP	BK3	BK4	BK5	BK6	BK7	BK8	BK9	BK10	BK11	BK12
91		P	P	P	P	P	P	P	P	P	P	P	P
92		54%	27%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
93		54%	27%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
94		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
95		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
96		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

For GUP, the overall problem = 54% (milk problem) x 50% (herd size problem) = 27%

For other LZs, the overall problem = 54% (milk problem) x 100% (i.e. no herd size problem specified) = 54%

These results are then multiplied by the herd size 'problem' to calculate the overall milk production problem for each combination of district and livelihood zone[16]. The overall problem specification tables can be found in columns BB to DA, and part of the table relating to Heys-Gu season camels' milk for poor households (signified by P in row 91) is reproduced to the right.

[16] It is assumed for the purposes of these calculations that the same 'problem' with respect to number of milking animals and milk output per animal can be applied to all livelihood zones within a single district. This may not be true if very different current conditions apply in the different LZs, or if the baselines were prepared for very different types of year. The alternative would be to update the two main milk production parameters (no. of milking animals and milk yield per day) for each wealth group, each season and each district-LZ combination. This was abandoned as impractical as it would add 4 more tables to the IS of the size of the herd size table. It is also difficult to see how the required volume of data could practically be collected in the field. If very detailed local analyses are required, then these can always be done using the single zone spreadsheets.

Entering the market prices problem (Sheet M)

The market price sheet contains space to enter a total of 28 prices, divided into 7 categories (see **Table 11**). The layout of the sheet is very similar to that for crop production, i.e. for each item there are 3 tables:

a) A table in which to enter current price (cols A to G)
b) A table showing the problem specification by district and LZ (cols I to T)
c) A table containing price data for the reference year (cols V to AK).

Table 11. Prices included in the Somalia Integrated Spreadsheet

A: Staple foods:	***C: Livestock sold:***	***E: Other income sources:***
1. sorghum	14. camels – export	22. ag.labour – gu
2. maize	15. camels – local	23. ag.labour – deyr
3. rice	16. cattle – export	24. wood/charcoal
B: Crops sold:	17. cattle – local	***F: Components of the livelihoods protection Basket:***
4. maize - gu	18. shoats – export	25. sugar
5. maize - de	19. shoats – local	26. water
6. sorghum - gu	***D: Milk prices***	27. inputs
7. sorghum - de	20. camels' milk – heys-gu	***G:Inflation***
8. cowpeas – gu	21. camels' milk deyr	28. exchange rate
9. cowpeas - de		
10. sesame		
11. groundnuts		
12. fruit/veg - gu		
13. fruit/veg - de		

These three tables are reproduced below for the first of the prices in the Somalia example IS – purchased sorghum.

	U	V	W	X	Y	Z	AA	AB	AC	AJ	AK
1		MARKET PRICES									
2		REFERENCE YEAR MONITORING DATA									
3											
4											
5											
6		Item:	sorghum		Unit:	SlSh	per	kg			
7		Region	District	Market	LZ						Average
8					NWA	GUP	BK3	BK4	BK5	BK12	
9					Reference year/season						
10					0202-0702						
11		Awdal	Baki	North-west	1,408						1,408
12		Awdal	Borama		1,408						1,408
13		-	-								-
14		-	-								-
15		-	-								-

Spreadsheet: \Som_ex\IS_example.xls: Sheet M

Beginning with the reference year price table, the following information is to be found within the green-shaded cells:

1. the name of the item (sorghum in the example)
2. the unit of measurement (SlSh per kg in the example)
3. the title of the reference season for each livelihood zone (0202-0702 for NWA, indicating the period February-July 2002)

4. the name of the market or group of markets from which the monitoring data are derived. For Somalia, prices are analysed by market region, and the problem specification for Baki and Boroma is derived from the average for north-west markets.
5. average price in the reference season (1408 SlSh per kg in the example)

There is also a column for average price for the district (col AK), which in the example is set to the reference season price for NWA, i.e. 1408 SlSh per kg[17].

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**MARKET PRICES**								**MARKET PRICES**					
2	**CURRENT YEAR MONITORING DATA**								**PROBLEM SPECIFICATION BY DISTRI**					
3	**YEAR**	**Example**				◄ indicates results								
4						=	100% (usually missing ref. data)							
5	**A: STAPLE FOOD**					<=	20%							
6	Item:	**sorghum**				>=	200%							
7	Region	District	Market	Unit:	Problem				LZ					
8				SlSh	specification									
9				per										
10				kg	curr.		rev.		NWA	GUP	BK3	BK4	BK5	BK6
11	Awdal	Baki	North-west	2,800	199%				199%	199%	199%	199%	199%	199%
12	Awdal	Borama	-	2,800	199%				199%	199%	199%	199%	199%	199%
13	-	-	-		100%	◄			100%	100%	100%	100%	100%	100%
14	-	-	-		100%	◄			100%	100%	100%	100%	100%	100%
15	-	-	-		100%	◄			100%	100%	100%	100%	100%	100%

As for crops, the next step is for the user to enter the current price for each district, 2800 SlSh per kg in the example. The resulting problem specification (199%) is returned in column E (shaded blue) and, as in the case of crops, the user has the option to override this calculated value with another value (which can be entered in column G).

The remaining table (cols I to T) gives the problem specification for each combination of district and livelihood zone.

	A	B	C	D	E	F	G
330	Crop:	**other crops**					
331	Region	District	Market	Unit:	Problem specification		
332				-			
333				per			
334				-	curr.		rev.
335	Awdal	Baki	North-west		100%	◄	150%
336	Awdal	Borama	-		100%	◄	150%
337	-	-	-		100%	◄	

Having entered current prices for purchased sorghum, the user continues to enter data for the remaining items included in the price sheet. The tables to the right provide two further data entry tables from the example spreadsheet; other cashcrops (included in other crops in the spreadsheet) and local cattle.

As with crops, column G (the revised or 'rev.' column) can be used to enter an estimated price problem for items for which price data are not available, e.g. other cashcrops in the example.

[17] The points made in footnote 11 for crops apply here to prices as well.

Adjusting prices for inflation (Sheet M)

The bottom set of tables on the market price sheet provides space for the user to enter data for an indicator of inflation. In Somalia, the exchange rate probably provides the best indicator of inflation, and exchange rate data have therefore been entered into this section of the spreadsheet.

	W	X	Y	Z	AA	AB	AC
733							
734							
735	**exchange rate**		Unit:	**SS**	per	**USD**	
736	District	Market	LZ				
737			NWA	GUP	BK3	BK4	BK5
738			Reference year/season				
739							
740	Baki	North-west	6,725				
741	Borama	-	6,725				
742	-	-					

The table to the right shows how reference year exchange rate data have been entered into the example integrated spreadsheet for the North-west agro-pastoral LZ (NWA). This next table shows what happens when a current year exchange rate is entered into column D. (Note that a change in the exchange rate is NOT part of the example presented in this guide, and that no figures for current exchange rate will be found in the example IS).

	B	C	D	E	F	G	H	I	J
735	**exchange rate**								
736	District	Market	Unit:	Problem				LZ	
737			SS	specification					
738			per						
739			USD					NWA	GUP
740	Baki	North-west	7,000	104%				104%	104%
741	Borama	-	7,000	104%				104%	104%
742	-	-		100% ◄				100%	100%

The spreadsheet calculates the current exchange rate as a percentage of reference (104% in this case). This figure is then taken as the best estimate of inflation since the reference year, and is used as the default price problem for any item where columns D (current price) and G (estimated problem specification) have been left blank. In other words, the inflation rate specified here is a default value that is applied where no other estimate of price change has been supplied by the user. It goes without saying that it is better for the user to enter an actual or estimated price directly into the spreadsheet, rather than relying upon this fairly crude inflation adjustment.

An example will perhaps best demonstrate how this inflation adjustment is applied. The table to the right shows how the figure of 104% is applied for wood/charcoal. Since no price problem has been specified for this product (columns D and G blank), the spreadsheet takes the default problem of 104% as the price problem for both districts (columns I and J). Where a current price problem is specified, however, then the inflation correction is ignored.

	B	C	D	E	F	G	H	I	J
627	**wood/charcoal**								
628	District	Market	Unit:	Problem				LZ	
629			-	specification					
630			per						
631			-	curr.		rev.		NWA	GUP
632	Baki	North-west		100% ◄				104%	104%
633	Borama	-		100% ◄				104%	104%
634	-	-		100% ◄				100%	100%

Entering other aspects of the problem (Sheet O)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	OTHER FOOD AND INCOME SOURCES												
2													
3	YEAR	Example											
4													
5			Estimated % of baseline access (I.e. quantity)										
6			Source:										
7	Region	District	gifts	food stocks	-	ag.labour - gu	ag.labour - deyr	lab.migration	remittances	wood/charcoal	gums/resins	other labour	loans
8													
9													
10													
11													
12													
13													
14													
15													
16	Awdal	Baki				75%							
17	Awdal	Borama				75%							
18	-	-											
19	-	-											
20	-	-											

Spreadsheet: \Som_ex\IS_example.xls: Sheet O

The table on sheet O allows the user to specify a problem of access to a range of 'other' food and income sources besides crops and livestock. For these items the problem is entered directly in terms of % access compared to the reference year. Only one 'problem' can be entered per district (so the same problem will be applied to all livelihood zones within each district[18].

The first three columns in the table (columns C, D and E) refer to other sources of food. In Somalia only two 'other' food sources are specified (gifts and food stocks) and the third option (column E) has been left blank. For these items the problem should be expressed in terms of the % of food available from these sources in the current compared to the reference year.

The remaining 8 columns in the table (columns F to M) refer to other sources of cash income. In Somalia these 'other' sources range from *gu* season agricultural labour to loans. As in the case of other food, the problem specification for these items should be in terms of the quantity that can be sold in the current compared to the reference year. The table below has been completed for the Boroma and Baki example, with access to *gu* season agricultural labour set to 75% of reference.

In addition to the 'quantity' problem, a 'price' problem is also applied to other sources of cash income. For three sources (agricultural labour – *gu*, agricultural labour – *deyr* and wood/charcoal) the price problem is derived from data entered into the market price sheet (sheet M). For the other 5 sources of cash income, the price problem is set as equal to inflation.

[18] This creates a potential problem where baselines have been prepared for different types of year, e.g. for a bad year in one LZ and an average year in another LZ within the same district.

	A	B	C	D	E	F	G	H	I	J
38	**OTHER ANALYSIS PARAMETERS**									
39										
40	**'COPING' STRATEGIES/EXPANDABILITY TO INCLUDE IN THE ANALYSIS**									
41	Specify the level of inclusion of different strategies/expandabilities below									
42	0% = exclude altogether									
43	100% = include full amount specified in baseline analysis									
44	50% = include half amount specified in baseline analysis									
45	etc.									
46	**Food**		**%included**	**Notes**						
47										
48	camels milk - gu		100%	changing pattern of milk/ghee sales						
49	camels milk - de		100%							
50	cows' milk - gu		100%							
51	cows' milk - de		100%							
52	shoats' milk - gu		100%							
53	shoats' milk - de		100%							
54	maize - gu		100%	changing pattern of crop sales						
55	maize - de		100%							
56	sorghum - gu		100%							
57	sorghum - de		100%							
58	cowpeas - gu		100%							
59	cowpeas - de		100%							
60	sesame		100%							
61	groundnuts		100%							
62	fruit/veg - gu		100%							
63	fruit/veg - de		100%							
64	lab.migration		100%	changes in labour migration (usually increase)						
65	gifts		100%	changes in gifts						
66	food stocks		100%							
67	-		100%							
68	other		100%							
69										
70	**Income**		**%included**							
71										
72	camels milk - gu		100%							
73	camels milk - de		100%							
74	cows' milk - gu		100%							
75	cows' milk - de		100%							
76	shoats' milk - gu		100%							
77	shoats' milk - de		100%							
78	camels - export		100%	changes in livestock sales (usually increase)						
79	camels - local		100%							
80	cattle - export		100%							
81	cattle - local		100%							
82	shoats - export		100%							
83	shoats - local		100%							

Spreadsheet: \Som_ex\IS_example.xls: Sheet O

The 'other' or 'O' sheet also allows the user to vary the extent to which different coping strategies are included in the analysis. The relevant section of the spreadsheet is reproduced above. Here the user can exclude a particular strategy (by setting the figure in the corresponding yellow-shaded cell to zero) or include it fully (by setting the yellow-shaded cell to 100%). An increase in livestock sales can for example be excluded from the analysis by setting cells C78 to C83 to 0%, and so on. For the purposes of the Boroma example, all the various coping strategies have been fully included (all yellow-shaded cells set to 100%).

The results page (Sheet R)

Once the problem specification data have been entered into sheets C, L, M and O, no other data entry or data manipulation is required. All the user need do is turn to the results and graphic sheets (sheets R and G) to view the output.

The results sheet is divided into several sections, each of which is headed by a title in bold within a dark grey-shaded box. The first three sections are as follows:

District Summary (rows 30 to 58) – provides a summary of assistance requirements (number of beneficiaries, amounts of food and/or cash), by district

Survival Deficit Analysis (rows 61 to 249, cols B to P) – A detailed breakdown of assistance requirements to fill any survival deficits, by district and livelihood zone.

Livelihoods Protection Deficit Analysis (rows 61 to 249, cols S to AE) – A detailed breakdown of assistance requirements to fill any livelihoods protection deficits, by district and livelihood zone.

The district summary

DISTRICT SUMMARY

Example

			SURVIVAL DEFICIT			L/HOODS PROT. DEFICIT		
Ad.Zone	District	Benefic-iaries	Either MT	OR Cash	Benefic-iaries	Either MT	OR Cash
Awdal	Baki	14,300	781	2,190	24,500	960	2,703
Awdal	Borama	66,100	3,620	10,140	111,200	4,360	12,193
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

The district summary table is in three sections, from left to right in the spreadsheet; survival deficit, livelihoods protection deficit and total. Sections 1 and 2 from the example spreadsheet are reproduced above and section 3 to the right.

Within each section results are given for the number of beneficiaries and the assistance requirement (expressed as either food or cash).

	TOTAL		
Ad.Zone	District	Benefic-iaries	Either MT	OR Cash
Awdal	Baki	24,500	1,741	4,893
Awdal	Borama	111,200	7,980	22,333
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
TOTALS		135,700	9,721	27,226
Further details in Table:		**B**	**G**	**H**

For each set of results within the district summary, the user can find further details in one of tables A to H, described below. For example, for further details on the total number of beneficiaries, the user is referred to table B.

Table 12 compares the results for Boroma derived from the single zone spreadsheet analysis with those from the integrated spreadsheet.

Table 12. Comparison between Single Zone and Integrated Spreadsheet results

Total requirements:	*Single Zone spreadsheet*	*Integrated spreadsheet*
No. beneficiaries	111,216	111,200
Either MT food	7863	7980
Or '000,000 SS cash	22017	22333

There are minor differences in the results from the two sets of analyses, but these are due to the rounding of results up or down in the single zone spreadsheet analysis. The main point here is that the calculations performed by the integrated spreadsheet are exactly those set out in earlier chapters of this guide, any of which is relatively easy to reproduce using pencil and paper.

The survival deficit analysis

More detailed results for the survival deficit can be found in tables A, C and E.

Table A: Estimated Rural Population Facing a Survival deficit

This table, reproduced below, summarises the estimated rural population facing a survival deficit, by district/LZ, and by district (note that the district result is rounded to the nearest 100).

	A	B	C	D	E	F	G	H	I	J	K
60											
61		SURVIVAL DEFICIT ANALYSIS									
62											
63		A. ESTIMATED RURAL POPULATION FACING A SURVIVAL DEFICIT									
64		Region	District	Total	LZ						
65					NWA	GUP	BK3	BK4	BK5	BK6	BK7
66		Awdal	Baki	14,300	0	14,250	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
67		Awdal	Borama	66,100	0	66,078	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
68		-	-	-	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
69		-	-	-	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
70		-	-	-	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX

Table C: Tons Food Required to Fill Survival deficit

This table, reproduced above, summarises the amount of food required to fill any survival deficit, by district/LZ, and by district.

	A	B	C	D	E	F	G	H	I	J	K
88											
89		C. TONS FOOD REQUIRED TO FILL SURVIVAL DEFICIT								Unit:	MT grain
90		Region	District		LZ	ration level (kg grain pppd) =			0.58		
91				Total	NWA	GUP	BK3	BK4	BK5	BK6	BK7
92		Awdal	Baki	781	0	781	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
93		Awdal	Borama	3,620	0	3,620	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
94		-	-	-	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
95		-	-	-	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX
96		-	-	-	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX	XXXXXXX

Table E: Cash Required to Fill Survival deficit

This table, not reproduced here, but with the same layout as table C, summarises the amount of cash required to fill any survival deficit, by district/LZ, and by district.

Table I: Wealth Groups Facing a Survival deficit

This table, reproduced in part below, indicates which wealth groups are likely to face a survival deficit, by District/LZ. It shows that in the example, all three wealth groups in GUP face a survival deficit.

	A	B	C	D	E	F	G	H	I	J	K
166											
167		I. WEALTH GROUPS FACING A SURVIVAL DEFICIT									
168		Region	District		LZ						
169					NWA	GUP	BK3	BK4	BK5	BK6	BK7
170		Awdal	Baki				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
171						Poor	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
172						Middle	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
173						B/Off	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
174		Awdal	Borama				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
175						Poor	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
176						Middle	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
177						B/Off	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
178		-	-		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
179					XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
180					XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
181					XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

The livelihoods protection deficit analysis

A similar set of tables provide further details of the livelihoods protection deficit results.

These are:

Table B: Estimated Rural Population Facing a Livelihoods Protection Deficit
Table D: Cash Required to Fill Livelihoods Protection Deficit
Table F: Tons Food Required to Fill Livelihoods Protection Deficit
Table J: Wealth Groups Facing a Livelihoods Protection Deficit
Two other tables complete the set:
Table G: Total Food Requirement to Fill Survival and Livelihoods Protection Deficits
i.e. the sum of results from tables C and F.
Table H: Total Cash Requirement to Fill Survival and Livelihoods Protection Deficits
i.e. the sum of results from tables D and E.

There are also a number of additional tables on the results sheet (rows 253 onwards) that contain intermediate results in the various calculations.

The graphics page (Sheet G)

This provides the user with an opportunity to view selected results graphically.

The first step is for the user to select the district, livelihood zone and wealth group to be graphed.

	A	B	C	D	E	F	G
1							
2							
3		1. SELECT DISTRICT TO GRAPH					
4							
5		Select (X)		Ad.Zone	District		
6			1	Awdal	Baki		
7		x	2	Awdal	Borama		
8			3	-	-		
9			4	-	-		
10			5	-	-		

This is done using three data-entry tables in the top-left section of sheet G (reproduced here). To make a selection, the user enters the letter x in the yellow-shaded column against the required item.

In the example presented here, the following selection has been made:

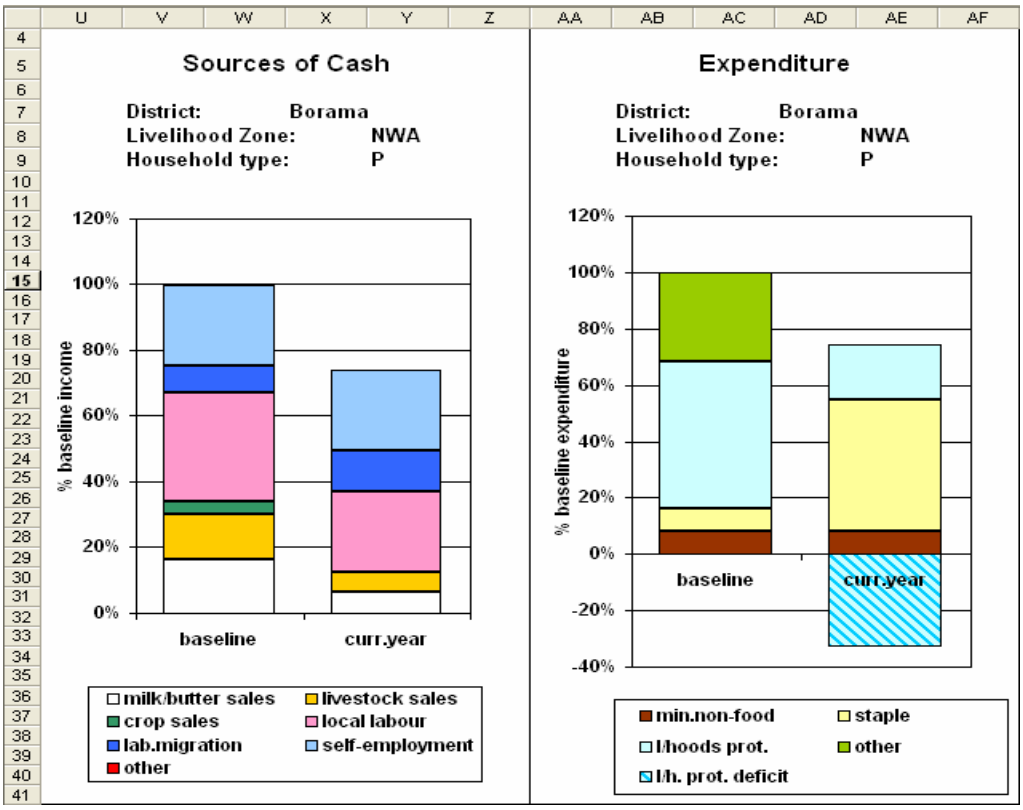
District: Boroma
LZ: NWA
Wealth group: Poor

Note: In order to change the selection, the user deletes the previous 'x' to remove the selection and enters a new 'x' in another row.
The graphs themselves can be found in columns M to AF.

There are three graphs; for food, cash income and expenditure.

The cash income and expenditure graphs are very similar to those in the single zone sheet, except that there are two bars (baseline and current year) rather than three (i.e. the '+ hazard' bar has not been included).

	H	I	J	K	L
1					
2					
3		2. SELECT LZ TO GRAPH			
4					
5		Select (X)	LZ		
6		x	NWA	1	
7			GUP	2	
8			BK3	3	
9			BK4	4	
10			BK5	5	
11			BK6	6	
12			BK7	7	
13			BK8	8	
14			BK9	9	
15			BK10	10	
16			BK11	11	
17			BK12	12	
18					
19		2. SELECT WEALTH GROUP TO GRAPH			
20					
21		Select (X)	WG		
22			VP		
23		x	P	1	
24			M	2	
25			R	3	



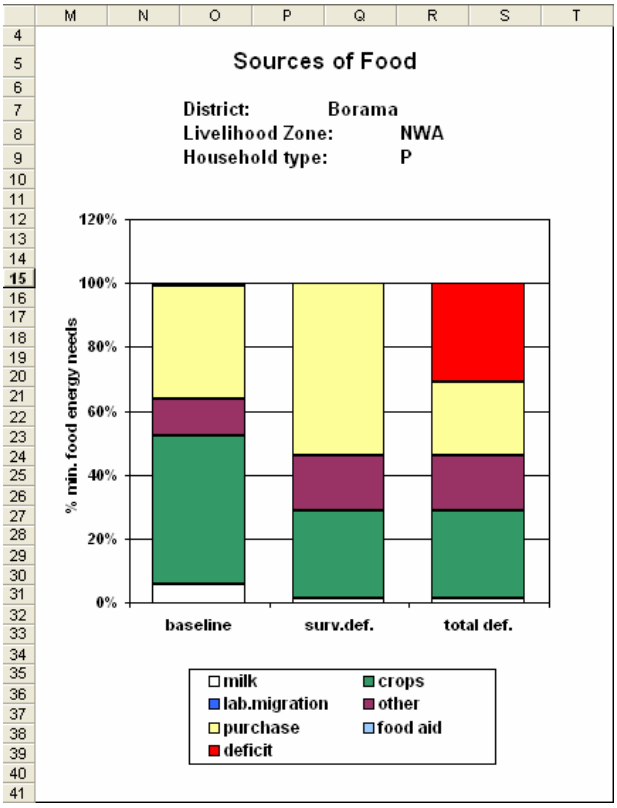
The 'sources of food' graph has three bars:

Baseline: food sources in the reference year

Surv. def: Food sources and food access, including any survival deficit.

Total def.: Food sources and food access, but showing the total deficit (i.e. the sum of the survival and livelihoods protection deficits) expressed in food terms.

In the Boroma example, presented here, poor households in NWA face a livelihoods protection deficit but not a survival deficit (so there is no deficit shown for 'surv.def.'). The 'total def.'bar chart shows that if the livelihoods protection deficit is expressed in food terms it is equivalent to roughly 30% of annual food needs.



Further down the graphics page is a table containing the food, income and expenditure data that are summarised in the graphic. Part of that table is reproduced below. Also included is the problem specification applied to each source of food and cash. This can be useful when checking the results for a particular combination of district, livelihood zone and wealth group.

	D	E	F	G	H	I	J	K
28								
29	DISTRICT	**Borama**						
30	LIVELIHOOD ZONE	**NWA**						
31	WEALTH GROUP	**P**						
32								
33								
34		3	Source of Food			6	10	
35		prob%				baseline	surv.def.	total.def.
36			camels milk - gu			0%	0%	0%
37			camels milk - de			0%	0%	0%
38		25%	cows' milk - gu			3%	1%	1%
39		26%	cows' milk - de			1%	0%	0%
40		24%	shoats' milk - gu			1%	0%	0%

The Baselines and Population Pages

These are the two remaining pages not reviewed so far. These are pages that the user need not refer to when running a current problem or scenario.

The baselines page (Sheet B)

The baselines page contains summaries of the baseline data for each of the livelihood zones included in the integrated spreadsheet. These summaries are read in from the various baseline storage sheets (NWA.xls, GUP.xls, etc.). It also includes all the detailed calculations of outcome for each combination of district and livelihood zone. The baselines page takes the problem specification for each source of food and income from the problem specification pages (sheets C, L, M and O) and generates a result for each wealth group (using the same calculations as for the pencil and paper analysis). The results are then fed into the calculations of assistance requirements which are summarised on the Results page (sheet R).

	C	D	E	F	G	H	I	J	K	L	M
1		**Livelihoods Baseline 1**			**Code:**						
2		**Northwest Agro-Pastora**			NWA						
3	**Food**	**V.Poor**			**Poor**			**Middle**			**B/Off**
4		B/line	Exp.	Total	B/line	Exp.	Total	B/line	Exp.	Total	B/line
5	camels milk - gu	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6	camels milk - de	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7	cows' milk - gu	0%	0%	0%	3%	0%	3%	8%	0%	8%	5%
8	cows' milk - de	0%	0%	0%	1%	0%	1%	1%	0%	1%	1%
9	shoats' milk - gu	0%	0%	0%	1%	0%	1%	3%	0%	3%	2%
10	shoats' milk - de	0%	0%	0%	1%	0%	1%	3%	0%	3%	4%

Baseline data for each of the livelihood zones included in the IS are tabulated in rows 1 to 84. Data for up to 12 livelihood zones are presented from left to right across the page.

The above example shows some of the baseline data for the North-west agro-pastoral LZ. Food sources are listed, together with the %kcals derived from each in the baseline or reference year, for each of four wealth groups[19]. Data on expandability and total access (=baseline+expandability) are also given. Data on cash income and expenditure are also included in this section of the IS.

	C	D	E	F	G	H	I	J	K	L	M
86	**CURRENT YEAR ACCESS**	**Baki**									
87		**NWA**									
88	**Food**	**Problem Spec.**		**Current Access - 'coping'**				**Current Access + 'coping'**			
89		VP+P	M+B/O	V.Poor	P	M	B/Off	V.Poor	P	M	B/Off
90	camels milk - gu	54%	54%	0%	0%	0%	0%	0%	0%	0%	0%
91	camels milk - de	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%
92	cows' milk - gu	25%	25%	0%	1%	2%	1%	0%	1%	2%	1%
93	cows' milk - de	26%	26%	0%	0%	0%	0%	0%	0%	0%	0%
94	shoats' milk - gu	24%	24%	0%	0%	1%	1%	0%	0%	1%	1%
95	shoats' milk - de	24%	24%	0%	0%	1%	1%	0%	0%	1%	1%

Below this baselines section of sheet B (from row 86 onwards) may be found the 'current year access' section of the sheet. This contains all the detailed calculations of outcome for each district and each livelihood zone. Part of the calculations for the North-west agro-pastoral zone of Baki district are shown above. For each source of food, a consolidated problem specification is carried over from sheets C, L, M and O. For NWA these problem specifications are listed in columns D and E. There are two sets of problems for variables related to livestock, one for very poor and poor households (VP+P) and one for middle and better-off households (M+B/O). Two different estimates of current access are then given for

[19] If data are missing for one or more wealth groups, all sources of food are set to zero, as in the case of the very poor in the NWA example.

each wealth group. The first of these (columns F to I above) relates to access without 'coping' (- 'coping'), i.e. without expansion of any of the sources of food and/or cash income. The second set of estimates (columns J to M) relates to access with 'coping' (+ 'coping'), i.e. including such expansion.[20]

Other sections of the 'current year access' section of sheet B contain similar calculations for cash income and expenditure, and the resulting deficits.

The population page (Sheet P)

The population page contains four tables of reference data that are used to calculate the number of beneficiaries (see calculating assistance requirements, page 53):

a) A breakdown of population by district and LZ (entered directly into the spreadsheet).
b) A wealth breakdown by LZ (read from the baseline storage files).
c) A table of household size by LZ (read from the baseline storage files).
d) A table giving the % population by livelihood zone (derived from tables (b) and (c))

These four tables from the example spreadsheet are reproduced (in part) below.

	A	B	C	D	E	F	G	H	I	J
1										
2		**POPULATION AND WEALTH BREAKDOWN**								
3										
4		RURAL POPULATION BY DISTRICT & LZ								
5		Region	District	Total	LZ					
6					NWA	GUP	BK3	BK4	BK5	BK6
7	1	Awdal	Baki	29,250	15000	14250				
8	2	Awdal	Borama	132,156	66078	66078				
9	3			-						
10	4			-						
11	5			-						

Sheet 'P' also contains a table labelled 'Exchange Rates'. This has been set up to deal with a relatively rare situation, i.e. an integrated spreadsheet that contains baselines with cash incomes expressed in difference currencies. Typically, of course, the same national currency will be used in all the livelihood zones included in any one spreadsheet. But this is not always the case, and north-western Somalia provides an example. While the Somaliland shilling is the predominant currency in the area, the Somali shilling is used in the east of the region. The exchange rate table from the integrated spreadsheet for the north-west of Somalia is reproduced below (note that this is different from the example IS). For LZs using the second or minor currency, reference year exchange rates for the two currencies are entered, both compared to the USD. In the case of the Nugal Valley LZ (NUG), for example, one US dollar could in the reference year be exchanged for 3888 Somaliland shillings or 11487 Somali shillings. Dividing 3888 by 11487 then gives a correction factor (0.33857) that can be used to convert any livelihoods protection deficit for NUG (which is calculated in the currency of the baseline, i.e. the Somali shilling) into the predominant currency (the Somaliland shilling).

[20]Estimates of beneficiary numbers and assistance requirements are always based upon the result with-coping. Note that sheet 'O' provides the user with the option of changing the extent to which individual coping strategies are included in the with-coping calculations. Any change made to sheet 'O' will change the deficit calculated 'with coping', which will in turn affect the total assistance requirements. For example, setting one or more coping strategies to zero in sheet 'O' will have the effect of increasing the calculated deficits (and therefore the amount of assistance required).

28									
29		**WEALTH BREAKDOWN BY LZ**							
30		% households		LZ					
31				NWA	GUP	BK3	BK4	BK5	BK6
32		V .Poor		0%	0%	18%	18%	18%	18%
33		Poor		40%	25%	38%	38%	38%	38%
34		Middle		35%	55%	30%	30%	30%	30%
35		B/Off		25%	20%	15%	15%	15%	15%
36		Total		100%	100%	100%	100%	100%	100%
37									
38		**HOUSEHOLD SIZE BY LZ**							
39				LZ					
40				NWA	GUP	BK3	BK4	BK5	BK6
41		V .Poor		-	-	-	-	-	-
42		Poor		6	6	-	-	-	-
43		Middle		7	8	-	-	-	-
44		B/Off		9	11	-	-	-	-
45		Average		7.1	8.1	0.0	0.0	0.0	0.0
46									
47		**% POPULATION, BY LZ**							
48				LZ					
49				-	-	-	-	-	-
50		V .Poor		0%	0%	0%	0%	0%	0%
51		Poor		34%	19%	0%	0%	0%	0%
52		Middle		35%	54%	0%	0%	0%	0%
53		B/Off		32%	27%	0%	0%	0%	0%
54		Total		100%	100%	0%	0%	0%	0%

56		**EXCHANGE RATES**							
57									
58		In this area, the predominant currency is the					Somaliland shilling (SISh)		
59				LZ					
60				HSP	NWA	GUP	NUG	TGA	FIS
61		currency		SISh	SISh	SISh	SoSh	SoSh	SISh
62				Reference year exchange rates (local currency per USD)					
63		exchange rate for predominant currency					3888	6454	
64		source (e.g. NW mkts)					NW mkts	NW mkts	
65		ex. rate for 2nd currency					11487	20791	
66		source (e.g. NE mkts)					NE mkts	NE mkts	
67				Exchange rate factor (I.e. figure by which to multiply cash to obtain					
68		Ex.rate		1	1	1	0.33847	0.310423	1