

TOOL 4

LIVELIHOOD ANALYSIS

IN GROUPS SELECTED BY GENDER AND WEALTH CATEGORY

AIM: TO DISCOVER THE EXTENT OF CASH AND SUBSISTENCE RELIANCE ON FOREST RESOURCES AND THE PROPORTION OF THE TOTAL ANNUAL LIVELIHOOD (FROM ALL SOURCES) THAT COMES FROM FOREST RESOURCES.

The wealth ranking exercise (or its equivalent) will have generated groups of households of similar status. These groups will take part in exercises in which they are consulted first about the main sources of their annual cash and non-cash incomes and then about a range of other forest issues. All the exercises are conducted with the same groups.

Explain that, by a household's annual income we mean **all** the resources that a household needs to get through the year successfully. People in rural areas produce much of what they need themselves, but they do need cash for some purposes.

A NOTE ABOUT PREPARATIONS FOR TOOLS 4 and 5

Tools 4 and 5 are based on a series of charts the outlines of which have to be drawn ahead of time, if being done manually. Otherwise the tables and charts will be produced electronically by spreadsheet (a standard template is available from the PROFOR website).

Tool 4 uses five charts while Tool 5 uses two. Seven large flip-chart sheets are thus needed for each sub-group to be worked with. A minimum of four subgroups is needed (see Tool 1) for which 28 flip-chart sheets would be needed before going to the field. The task is made much easier if three or four facilitators help and if there are one meter long rulers available (or A1 cardboard sheets to act as rulers – such as the backs of flip-chart pads). The task still takes about half a day but it is a good way of making facilitators thoroughly familiar with the charts before they are used in the village. Those training the facilitators should be present to help throughout, to reduce errors.

Another task for facilitators is to count out 20 beans or stones into each of 40 or so small plastic bags—enough for 10 per group if it has been decided that there will be 10 participants in a group. Allowing a few spares, that means 800–900 beans or stones.

It is important to choose an object of a standard size and that will not confuse participants by breaking in half during the exercise. (It should not be too edible—avoid peanuts.) Choose beans or stones that do not roll about or blow away. Dry, hard maize kernels, haricot beans, coffee beans or gravel work well.

The counting is quick with a few helpers. It is important that there are exactly 20 beans in each bag.

Materials needed: 28 (7 x number of groups—it might be more than this) pre-drawn flip-chart sheets; other blank flip-chart sheets; plenty of marker pens in black (for drawing charts) and in other colors (for filling them in). Ideally, 4 meter-long rulers.

Counters for participants. Each participant in a group needs a plastic bag with 20 stones or beans in it—say $20 \times 10 = 200 \times 4 = 800$ in all.

Calculators, compasses and protractors will be needed to prepare pie charts on flip-charts for Tool 4. Calculators are needed for percentages on other tools. Where possible, the use of laptop computers, with all the sheets set up within a spreadsheet program, is highly recommended. This saves considerable time and is a more secure method of data collection.

So a household's annual income means:

- All the items grown on farm or gathered from forests (including timber) or other off-farm natural resources, *and sold*.
- All the items, grown on farm or gathered from forests (including timber) or other off-farm natural resources, and *consumed or used at home without being sold*.
- Money *received in wages or through trading*.
- Money *sent by other family members* living and working outside the community (remittances).

STEP 1

AN OVERVIEW OF THE MAIN CASH COMPONENTS OF THE HOUSEHOLD'S ANNUAL LIVELIHOOD

a blank table layout for this step is provided on page 9

First

- Write the heading 'Forest products' at the top of the left hand column, and have group participants list all those they can think of that are regularly sold—the number will vary, which is why the chart cannot be completely pre-drawn.
- Then write the heading 'Farm produce—crops'
- Then write the heading 'Farm produce—livestock' and do the same.
- Finally write the heading 'Other sources of cash'. Prompt if necessary for 'wage-laboring', 'wages', 'trade', 'remittances', 'compensation payments', pensions, etc.

Second

- Give each individual in the group 20 beans/stones in a plastic bag.
- Get group members, one by one, to assign ALL their 20 beans/stones across the categories on the chart, putting more beans/stones where cash income sources are more important.
- Make sure to say that it is fine to leave empty squares if no cash income comes from that source.
- Do not let individuals put beans on generic lines such as 'forest products', 'farm produce' but only on specific

sources of income—'gum', 'charcoal' 'maize', etc. (see filled chart below).

- As each individual completes his/her column, and is satisfied with it (they often want to adjust a little), write the numbers in the squares, and return the beans/stones to the individual. Check that for each individual allocated 20 stones the numbers written add up to 20. Begin again with the next person.

Third

- At the end of Step 1, count totals laterally, and put them in the column on the right.
- Check that each vertical column totals 20 and that (if there are 10 people in the group) the next column to the right totals 200.

Later that evening

Work out the percentages and write them in. (This is unnecessary if the data have been recorded directly onto a computer).

STEP 2

AN OVERVIEW OF THE MAIN NON-CASH COMPONENTS OF THE HOUSEHOLD'S ANNUAL LIVELIHOOD

(following the same procedure in Tool 4 Step 1)

a blank table layout for this step is provided on page 10

First

- Write the heading 'Forest products' at the top of the left hand column, and have group participants list all those they can think of that are regularly used. Go through all the items in step 1 (since many items are of course used in the household as well as sold) and add to them as necessary—the number will vary which is why the chart cannot be completely pre-drawn.
- Then write the heading 'Farm produce—crops'
- Then write the heading 'Farm produce—livestock' and do the same. Go through the list on chart 1 and add to it if necessary.

AN EXAMPLE OF TOOL 4 – STEP 1 CASH COMPONENTS OF HOUSEHOLD'S ANNUAL LIVELIHOOD

BUSONGO VILLAGE, SHINYANGA, TANZANIA — GROUP 1 POOR WOMEN

	Group Participants										Totals	%
	1	2	3	4	5	6	7	8	9	10		
Forest products											27	14%
Gum	3	-	-	7	-	-	3	6	5	-	24	
Charcoal	-	-	-	3	-	-	-	-	-	-	3	
Farm produce											150	75%
Cotton	11	10	15	6	10	10	5	14	6	6	93	
Sesame for oil	2	-	-	-	-	-	-	-	-	-	2	
Green gram	-	-	-	-	-	-	3	-	-	-	3	
Groundnuts	-	3	-	-	-	-	-	-	-	-	3	
Maize	4	7	3	4	5	4	2	-	5	4	38	
Sorghum	-	-	2	-	5	-	4	-	-	-	11	
Other sources of cash											23	11%
Petty trade	-	-	-	-	-	6	3	-	4	10	23	
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%

AN EXAMPLE OF TOOL 4 – STEP 2 NON-CASH COMPONENTS OF HOUSEHOLD'S ANNUAL LIVELIHOOD

BUSONGO VILLAGE, SHINYANGA, TANZANIA — GROUP 1 POOR WOMEN

	Group Participants										Totals	%
	1	2	3	4	5	6	7	8	9	10		
Forest products											89	44%
Wild green leaves	-	1	1	1	2	-	1	1	1	1	9	
Fuelwood	2	1	2	2	2	-	2	2	2	2	17	
Charcoal	2	1	1	-	1	3	1	2	1	-	12	
Mushrooms	-	1	1	1	-	-	-	-	-	-	3	
Tamarind	2	1	1	2	1	-	1	1	1	1	11	
Honey	-	1	1	1	-	-	-	-	-	1	4	
Materials for building	2	1	2	1	2	1	1	2	2	1	15	
Thatch grass	1	1	1	1	1	1	1	1	1	1	10	
Fodder	-	1	1	1	1	-	-	1	2	1	8	
Farm produce											111	56%
Maize	2	2	1	1	2	5	2	3	3	2	23	
Sorghum	1	2	1	2	1	-	1	1	2	1	12	
Groundnuts	2	1	1	1	-	3	1	1	1	1	12	
Mung beans	-	1	1	1	2	-	1	1	1	1	9	
Sweet potatoes	2	1	2	3	3	3	3	2	2	2	23	
Sesame	1	-	-	1	1	-	1	-	-	-	4	
Greengram	1	1	1	-	-	-	1	1	-	1	6	
Green vegetables	1	1	-	-	-	2	1	1	1	1	8	
Red Beans	1	1	1	-	1	2	1	-	-	1	8	
Fruits	-	1	1	1	-	-	1	-	-	2	6	
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%

- Finally write the heading ‘Food for work, barter’.

Prompt if necessary.

Second

- Give each individual in the group 20 beans/stones in a plastic bag.
- Get group members, one by one, to assign ALL their 20 beans/stones across the categories on the chart, putting more beans/stones where their non-cash income sources are more important.
- Make sure to say that it is fine to leave empty squares if no cash income comes from that source.
- Do not let individuals put beans on generic lines such as ‘forest products’, ‘farm produce’ but only on specific sources of income – ‘gum’, ‘charcoal’, ‘maize’, etc. (see completed chart on page 3).
- As each individual completes his/her column, and is satisfied with it (they often want to adjust a little), write the numbers in the squares, and return the beans/ stones to the individual. Check that the individual allocated 20 stones and numbers written add up to 20. Begin again with the next person.

Third

- At the end of Step 2, count totals laterally, and put them in the column on the right.
- Check that each vertical column totals 20 and that (if there are 10 people in the group) the next column to the right totals 200.

Later that evening

Work out the percentages and write them in (if manual data recording is used).

STEP 3

PROPORTION OF THE HOUSEHOLD’S ENTIRE ANNUAL INCOME THAT COMES FROM CASH SOURCES, AND PROPORTION WHICH COMES FROM NON-CASH SOURCES

a blank table layout for this step is provided on page 11

Explain that in the last two exercises we have looked at the income that comes from cash sources, and the income which comes from non-cash sources.

The pre-prepared chart is placed on the floor. Make sure each individual has his/her small bag containing 20 beans/ stones. Take someone’s pile of stones and pile it on the mid-line between cash and non-cash. Explain as follows, demonstrating as you go:

‘Suppose this pile of stones represents your household’s whole annual income, from all the sources we have just looked at. Let’s split it into two, to show how big a pile the cash part of that income represents, and how big a pile the non-cash part of it represents. This side of the line is the cash side, and that side is the non-cash side. (Make it clear which is which if participants are not literate).

If you are a school teacher, probably most of your income is in cash, like this, but a little comes from the fodder your wife gathers for your animals – so you use some non-cash sources too. If you are a farmer, you might decide that your cash pile looks smaller, like this, and your non-cash pile larger, like this.’¹

It is important to try to avoid using the words ‘proportion’ or ‘percentage’ – these are too abstract. Invite one of the more self-confident participants in each group to have a try first. S/he can spend time thinking about it and pushing stones to and fro across the line. Do not hurry him/her.

1 Some reviewers found it hard to believe that villagers would be able to make this cash/ non-cash estimate. However, from our experience at a variety of sites and wealth groups, so long as it is explained and demonstrated in an un rushed way, making these estimates gives them no trouble at all. It is essentially the calculation that rural people have to perform in their heads to get through the year.

AN EXAMPLE OF TOOL 4 – STEP 3 PROPORTION OF INCOME FROM CASH AND NON-CASH SOURCES

BUSONGO VILLAGE, SHINYANGA, TANZANIA — GROUP 1 POOR WOMEN

	CASH	NON-CASH	Total
1	12	08	20
2	11	09	20
3	11	09	20
4	10	10	20
5	11	09	20
6	10	10	20
7	08	12	20
8	05	15	20
9	12	08	20
10	08	12	20
TOTALS	98 49%	102 51%	200

When the individual is happy with the relative sizes of his/her two piles, say, ‘So—you mean this pile to represent cash and this pile non-cash. Am I right?’ When he/she agrees, count the stones in each pile, write the numbers in the cash and non-cash columns against number 1 below, and start with the next person.

This exercise has been tested successfully in a variety of country contexts. Those who have not observed it being carried out find it hard to believe that participants do not find the assessment difficult, once they have understood what is being asked for. This represents the rough and ready calculations that rural people have to make in their heads every year.

STEP 4 CALCULATIONS FOR FACILITATORS TO UNDERTAKE, BASED ON TOOL 4, STEPS 1, 2 AND 3

a blank table layout for this step is provided on page 12

NB: Tool 4 Step 4 does not need to be done with the villagers. It is an analytic tool that can be done by facilitators in the evening to prepare for the plenary report-back to the village (see Section 4).

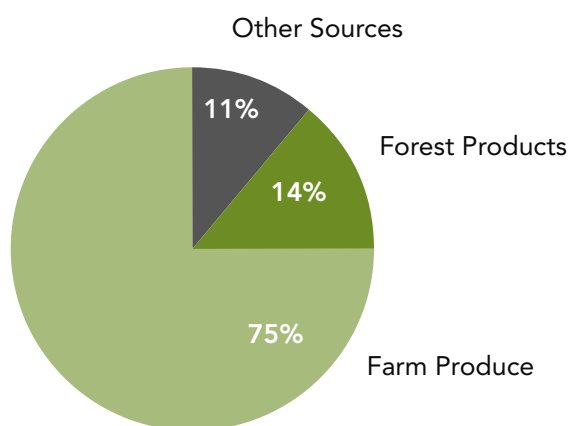
Tool 4 Steps 1–3 provide the data for a set of diagrams to express the contribution of forestry to livelihoods in terms of a set of simple pie charts for communication both to local audiences and national-level policy audiences. The choices made by individual participants in Step 1 (their own main sources of cash coming from forest resources, farm resources and other cash sources), and Step 2 (forest and farm-based non-cash livelihood resources) are totalled and then represented as percentages on the charts. They are turned into pie charts for presentations back to the community and to higher level bodies in the following way.²

1. For each of Step 1 and Step 2, work out what percentage of the total is taken up by each of the group’s ‘forest products,’ ‘farm produce,’ ‘livestock (if any)’ and ‘cash sources (if any)’.
2. Draw a large pie chart (circle) for each step, using compasses.
3. Using a protractor, and remembering that a circle has 360°, each percentage category can be represented on the circle by multiplying the percentage by 3.6 to give correct proportions.

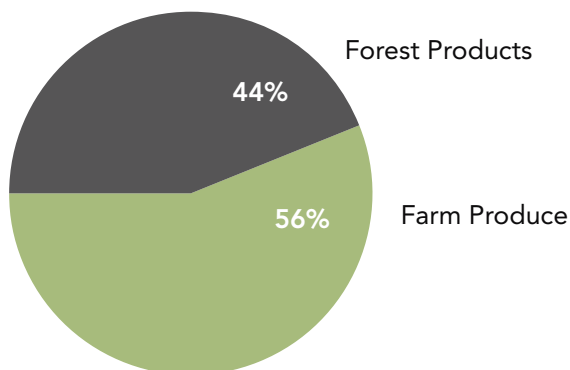
² If computers are available these pie charts can easily be generated with Excel. But if poorly resourced district officials are being trained, it is better that they know how to make the calculations and present findings without using computers.

Poor Women	Cash				Non-Cash		Cash + non-cash %
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Forest Products	14	6.86	7	44	22.44	22	29
Farm produce	75	36.75	37	56	28.56	29	66
Livestock	0	0	0	0	0	0	0
Other Cash	11	5.39	5	-	-	-	5
Totals (%)	100	49.00	49	100	51.00	51	100

PIE CHART FROM STEP 1 IN BUSONGO, TANZANIA
POOR WOMEN, CASH



PIE CHART FROM STEP 2 IN BUSONGO, TANZANIA
POOR WOMEN, NON-CASH



4. For example, suppose the chart gives:

Forest products	14%	x	3.6	=	50 degrees
Farm produce	40%	x	3.6	=	144 degrees
Livestock	35%	x	3.6	=	126 degrees
Other cash sources	11%	x	3.6	=	40 degrees
TOTALS	100%			=	360 degrees

A third step asks participants to divide their piles of stones into two which represent, by their size, the relative weighting of cash and subsistence components in their annual income. In the case of the Busongo 'poor women' group, this came to 49% from cash, and 51% from subsistence items.

Combining results from the three steps

Using these weightings, the two pie-charts representing the cash and subsistence components of the income can be combined into a single final pie-chart which represents the contribution (cash and subsistence) of forests, agriculture, livestock, and cash-income to the total annual livelihood. The way to make this calculation (using no more than a calculator) follows below.

Column 1—shows the original cash figures from Tool 4 Step 1.

Column 4—shows the original non-cash figures from Tool 4 Step 2.

Columns 2 and 5—From Tool 4 Step 3 we discovered that in the case of the poor women's group from Busongo, the cash contribution to the year's income was about 49%, and the non-cash contribution is 51%. Write these figures in at the bottom of these columns.

Column 2—To obtain the figures that total 49% in column 2, divide each figure in column 1 by 100, and multiply by 49.

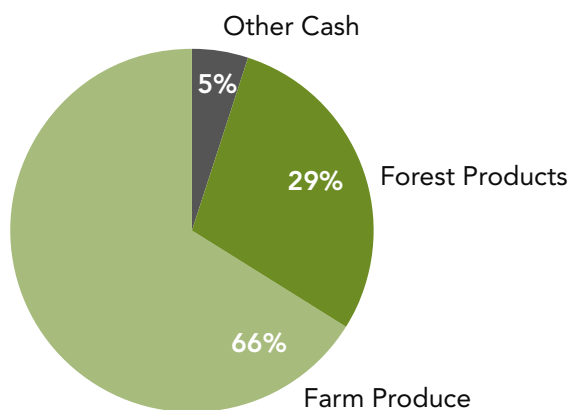
Column 5—To obtain the figures that total 51% in column 5, divide each figure in column 4 by 100, and multiply by 51.

Columns 3 and 6 round the figures up or down so you have whole numbers. Round figures coming to .50 or above up to the next whole number, and round those coming to .49 or less, down to the next whole number, as shown.

Column 7—Add together the figures in columns 3 and 6 to obtain the numbers in Column 7, which should then total 100%. Column 7 gives you the combined cash and non-cash contribution of the listed items to the annual income. Thus Agricultural Products contribute 66% and Forest Products 29%.

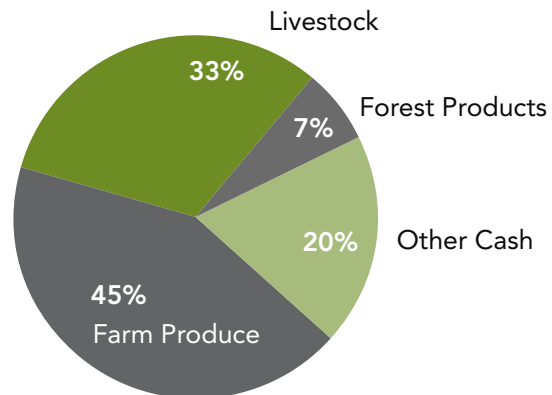
The resulting pie-chart looks like this:

PIE CHART FROM STEP 1 IN BUSONGO, TANZANIA POOR WOMEN, CASH AND NON-CASH

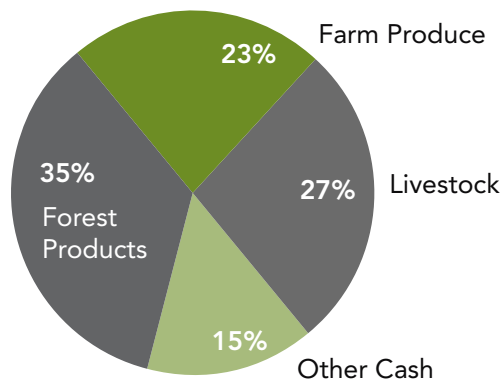


All three of these pie-charts give quick instantly-accessible ways of seeing the extent to which Busongo’s poorer women depend on forest resources. By contrast, the way the three pie-charts look in the case of Busongo’s middle-income and rich men is displayed at right.

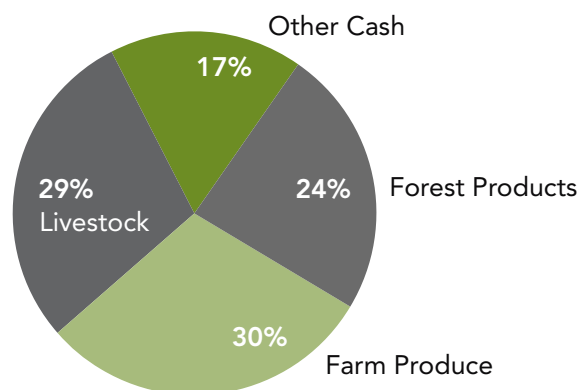
PIE CHART FROM STEP 1 IN BUSONGO, TANZANIA MIDDLE-INCOME AND RICH MEN, CASH



PIE CHART FROM STEP 2 IN BUSONGO, TANZANIA MIDDLE-INCOME AND RICH MEN, NON-CASH



PIE CHART FROM STEP 3 IN BUSONGO, TANZANIA MIDDLE-INCOME AND RICH MEN, CASH AND NON-CASH



RANKING THE IMPORTANCE OF TREE AND FOREST PRODUCTS DRAWN FROM TOOL 4

A ranking of forest products, in terms of their importance for both cash and non-cash use, can be made by referring to the first two data tables of Tool 4. Each forest product is listed in the table below, using the totals for each respondent group to rank their importance, beginning with the highest scoring products. Where products have the same total score they are given the same rank (see example). The number of ranked products is also recorded.

Several issues stand out:

- All groups rely on a greater range of forest products for their non-cash needs than their cash needs.

- Each group relies on a different forest product as their main source of cash income: for A/B men it is bushmeat, for A/B women it is mushrooms, for C/D men it is snails, and for C/D women it is firewood.
- The C/D women rely on the largest range of forest products for cash, whilst the C/D men utilize the largest range of forest products for non-cash needs.
- Bushmeat (i.e. hunting) is predominantly a male activity.
- Mushroom and snails appear to be the most widely used non-timber forest products (in cash and non-cash terms).
- Medicinal plants are also widely used by all groups, although they have a lower rank than for mushrooms and snails—perhaps as a consequence of the intermittent need for medicine compared to the everyday need for foodstuffs.

RESULTS FROM THE ANALYSIS OF TOOL 4 RANKING THE IMPORTANCE OF TREE AND FOREST PRODUCTS, BY GENDER AND BY WEALTH RANK

ASSIN AKRPONG, GHANA

Forest Product	Poor women		Middle/rich women		Poor men		Middle/rich men	
	Cash	Non-cash	Cash	Non-cash	Cash	Non-cash	Cash	Non-cash
Bushmeat	1	1			3	1		6
Wrapping leaves	2					13	4	
Mushrooms	2		1	5		2	3	3
Charcoal	2	4					5	9
Wild Yam		4				3	6	5
Sponges		7		9		7		
Spices				6		11		
Snails		6		3	1	5	2	2
Pestle		2				9		7
Palm wine (adoka)					3			
Medicines		8	2	4	2	7		4
Lumber								
Handicrafts				1				
Fruits and Nuts				6		12		
Firewood		3		2		4	1	1
Chewsticks				6		10		7
Building materials		9				5		
Total number of ranked products	4	9	2	9	4	13	6	9

Note that low numbers mean a high ranking

**LAYOUT FOR TOOL 4 – STEP 3
PROPORTION OF INCOME FROM CASH AND NON-CASH SOURCES**

Name of location:

Name of group:

	CASH	NON-CASH	Total
1			20
2			20
3			20
4			20
5			20
6			20
7			20
8			20
9			20
10			20
11			20
12			20
13			20
14			20
15			20
16			20
17			20
18			20
19			20
20			20

