

# Module 4:

# **FARM MANAGEMENT TOOLS**

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# Introduction

This module features nine farm management tools, all can be used at farm level and on individual farm enterprises to analyse and plan farm management activities.

They can be used for diagnosis of an existing situation, planning for the future and monitoring progress of farmers throughout the year. Here you will learn when to apply the different tools and how to use them.

# Session 4.1

## Constraints and opportunities

### Learning outcomes:

Understand the purpose of the  
instrument

Ability to know when to use the method

Ability to use the method

# Constraints and opportunities analysis

This session explains the tool of constraints and opportunities analysis; a tool used to identify weaknesses, potentials, the causes of the weaknesses and strategies for building potential strengths.

# *Constraints and opportunities analysis*

The constraints and opportunities analysis is a tool used to identify specific problems within the farming system as a whole or within individual enterprises.

The tool helps a farmer identify weaknesses and potentials within the whole system or its parts. It also helps identify the causes of those weaknesses.

## *Constraints and opportunities analysis*

The tool can help the farmer develop strategies for overcoming the weaknesses and building on the potentials identified.

The constraints and opportunities analysis is used to diagnose the situation of the farm or selected enterprises.

# *Constraints*

A constraint is a situation or factor that prevents the goals set by the farmer from being attained.

Constraints can be physical, climatic, economic, institutional, social and political.

Some of them may fall within the control of the farmer while others may not.

## *Constraints*

A farmer uses a constraints analysis to trace the source or cause of a problem.

Most problems are symptoms of other problems. It is important that the farmer is aware of the cause of the problem so that the farmer doesn't waste resources treating a symptom alone.

The constraints analysis takes into account all factors so that proposed actions could be taken to address the constraints.



## *Constraints*

For example, let us say a farmer identifies low income as a constraint in an enterprise.

Is this the cause of the problem?

What is the cause of the low income?

Low income may be due to low yield, low price or both.

## *Constraints*

Low yields may be due to low input use, which may occur as a result of high costs or non-availability of inputs, lack of technology, attack of pests and diseases, or lack of irrigation water.

On the other side, low prices may be due to poor quality of production, seasonality of the produce, oversupplies of produce in the market, lack of market information, poor quality of produce, lack of storage facilities, lack of drying facilities etc.

# *Constraints*

Constraints may also be related to the physical factors such as soil type, climatic factors, or to socio-cultural, policy and institutional over which farmers have no control.

These constraints are not always obvious, so they need to be pointed out.

# *Constraints*

When farmers know what the real constraints are, they will know which constraints they can change and which they cannot change.

Farmers will be in a position to make decisions about how to change the ones they can change and how to change the farm to make profits within the constraints they cannot change.

# *Opportunities*

In planning for improvements on farm, opportunities need to be considered in the light of the identified constraints.

Opportunities should be identified in relation to the constraints in order to design improved farm plans.

## *Conducting an analysis*

To conduct a constraints analysis requires two tools: a constraints tree and a constraints and opportunities matrix.

A constraints tree helps the farmer trace the actual constraint by refining and digging deeper into the issue.

Having completed a constraints tree, the analysis can be completed by using a constraints and opportunities matrix.

## *Example; Conducting an analysis*

The farmer experiences low enterprise profitability. Low profitability is found to be caused by low yield and low price.

Here low yield is found to be caused by three different factors:

Untimely planning

Pest infestation

Poor soil

## *Example; Conducting an analysis*

Low price is found to be caused by two factors:

Poor quality produce

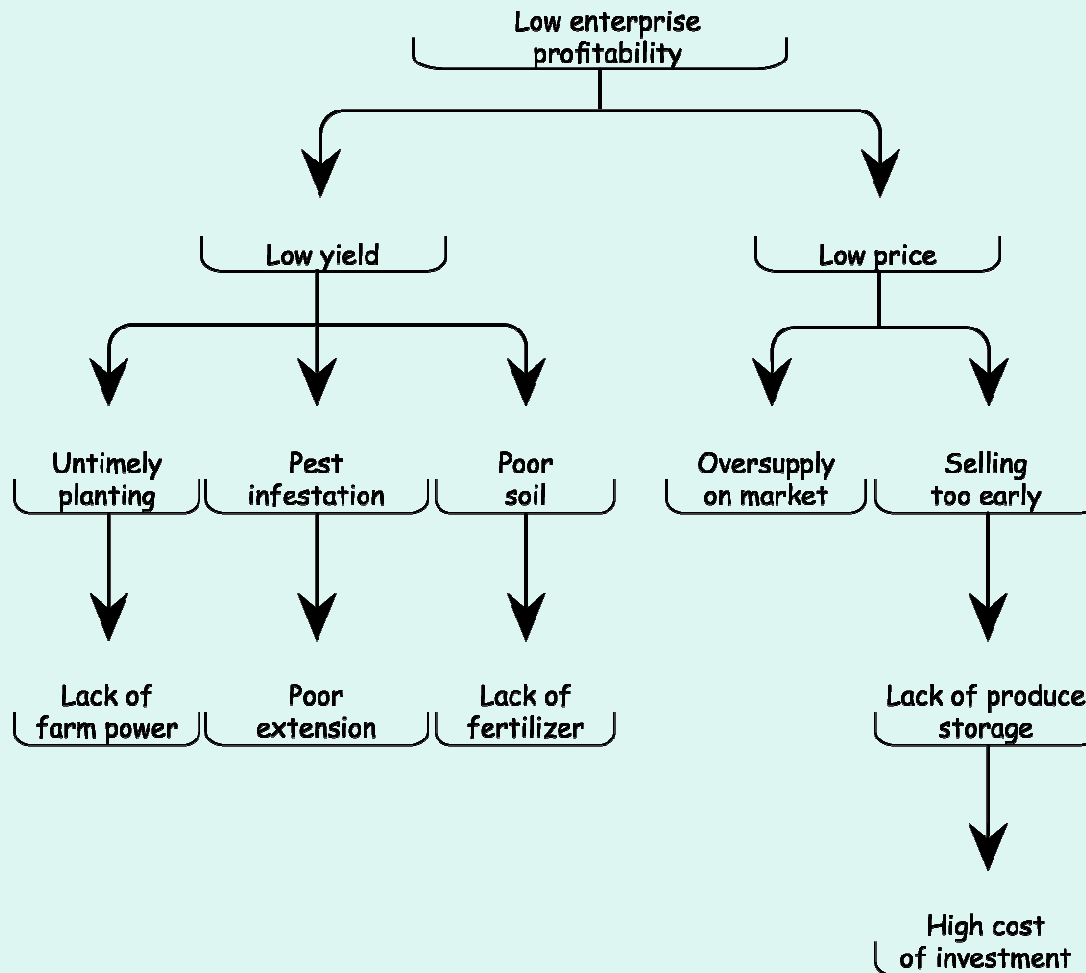
Selling early

Each of these factors are in turn caused by another factor.

This process of identifying the causal constraints continues until it reaches a logical conclusion within the immediate knowledge of the farmer.



# *Conducting and analysis : Example of a constraints tree*



## *Example; Conducting an analysis*

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### **Note**

It is important that the constraints identified must be real and not just possible.

In other words, they must be things the farmer knows or believes to be true about the farm or farm situation.

## *Constraints and opportunities analysis*

After a constraints tree has been completed, list the constraints and identify the opportunities

A format of a matrix is shown on the next slide

# *Constraints and opportunities matrix*

Enterprise:					
Key constraints	Lowest level constraints	Opportunities	Changes to be made to current practice	Resources needed	Who is responsible

## *Steps for completing the matrix*

1. **Enterprise:** Write the enterprise that you are engaged in.
2. **Key constraints:** Using the constraints tree analysis as a guide, identify the key constraints in each particular enterprise. List all the constraints except the last one. (The last one is the lowest level constraint.)
3. **Lowest level constraints:** These are the constraints listed at the end of a particular listing of constraints. They are usually the boxes at the bottom of the constraints tree.

## *Steps for completing the matrix*

4. **Opportunities:** Decide and write down a specific opportunity to address each of the identified lowest level constraints; write specific opportunities.

Constraints will present new objectives or opportunities to pursue. In some cases something will need to be fixed. In other cases, the constraints may point to an opportunity not considered before.

## *Steps for completing the matrix*

- 5. Changes to be made to current practice:** Specify the changes to be made to current practices. Consider the following when deciding what changes to make:
- (i) *Practices*: In what way does my current management practice need to be changed to address the constraint identified?
  - (ii) *Technology*: What are the current technologies available? What new technologies can be adapted for improving the enterprise?

## *Steps for completing the matrix*

Changes should reduce or remove existing constraints; they should focus on the lowest level constraint. Changes can relate to enterprises, the farm and the non-farm area.

For example, at the enterprise level, changes may mean changing an agricultural practice. At the whole-farm level, the changes may include the introduction of alternative enterprises.



## *Steps for completing the matrix*

6. **Resources:** What resources are needed (technical, financial and human)? Is there room for expanding the existing resources for the enterprise selected?
7. **Who is responsible:** Identify the person (s) responsible for implementing the identified changes.

## *Steps for completing the matrix*

8. **Once changes and resources have been identified,** the overall effects on the farm system should be appraised. In practice, many enterprises are technically and economically interrelated.

For example, higher grain yields may increase the availability of straw as feed for livestock. A small change may affect the whole farm-household system, posing many questions to be answered by farmers and extension workers.

*An example of a completed constraints and opportunities matrix using the information from the constraints tree shown earlier*

Enterprise: Maize					
Key constraints	Lowest level constraints	Opportunities	Changes to be made to current practice	Resources needed	Who is Responsible
Low profitability -Low price	Oversupply on market	Introduce a higher value crop; Soybeans	Plant half the maize lands under Soy beans	Extension information on how to grow Soybeans.	Farmer with support from extension service
Low profitability -Low price -Sell too early -Lack of product storage	High cost of investment relative to ability to finance	Investigate alternative options; seek loan	Train labour to pack and store for the market	Training support from extension service	Farmer with support from extension service
Low profitability -Untimely planting	Lack of farm power	Negotiate with brother-in-law to use tractor	Use tractor on at least 50% of the farm		
Low profitability -Pest infestation	Poor extension information	Learn about integrated pest management at FFS	Apply ISP on fields	Training	Farmer with support from extension service
Low profitability -Poor soil	Lack of fertilizer	Buy fertilizer	Apply fertilizer on 50% of crops	Guidelines on using fertilizers	Farmer and rural entrepreneur with support from extension service

# *Analyzing constraints and opportunities*

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## **Note**

There is no single right or wrong set of answers

Each analysis will differ depending on the resource base of the farm , the farmer's attitude toward risk or the reliability of information.

What is most important is that farmers begin to apply a systematic process of identifying constraints and opportunities. This will help them improve their farm management skills.

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## Session 4.2

# Gross margin budgeting

### Learning outcomes:

- Understand the purpose of the instrument in diagnosis and planning
  - Understand the application of the tool for forward planning
- Understand the use of the tool in choosing between alternatives
  - Understand when to apply the budgeting tool
    - Understand how to apply the tool
  - Ability to know when to use the method
  - Ability to carry out the method
- How to budget for annual crops/ enterprises
- How to budget for livestock and perennials

# Gross margin budgets

This session explains the concept of a gross margin, its relation to production costs, gross income and profit. A gross margin is a simple and powerful tool for analysis and planning.

You will look at the components of gross margin and learn how to calculate it and when to use it.

## *What is a gross margin budget?*

The term gross margin generally refers to the remaining income from an enterprise after the variable costs are deducted;

Gross income less variable costs.

A gross margin budget is a fairly detailed estimate of the output, cost and profitability of individual crop and livestock enterprises.

The gross margin budget includes all variable costs involved in producing the enterprise.

## *What is a gross margin budget?*

Gross margin is not profit; it does not include all costs; excludes fixed costs which the enterprise shares with other enterprises. But it is an indication of the profitability of an enterprise.

If an enterprise does not have a positive gross margin, then that enterprise is not profitable.



## *What is a gross margin budget?*

Gross margin can be used to compare the performance of a single enterprise using different farming practices and technologies.

Similarly, it can be used to calculate the potential profitability of growing an entirely new crop if farmers wish to diversify their products.

## *What is a gross margin budget?*

A gross margin is usually calculated on a unit basis.

It can be calculated on a per hectare basis, or as a return to labour, based on the number of days worked by the farmer and his/her family. These would be expressed as:

\$ per ha, \$ per worker, \$ per person day

## *What is a gross margin budget?*

Farmers who market some farm products should know the costs of production and should be able to calculate the gross margin.

This will help farmers to analyse the current performance of an enterprise using current prices and input-output information.

## *What is a gross margin budget?*

Using the gross margin they can project information into the future. This will help them plan and make decisions. This is called budgeting.

# Components of a gross margin

The gross margin is made up of two major parts:

Gross income

Variable costs

The basic calculation for a gross margin is as follows:

$$\text{Gross margin} = \text{Gross income} - \text{Variable costs}$$

## *How can gross margin be used?*

Gross margin is a simple, useful and practical tool for assessing the comparative profitability of different farm enterprises or different technologies.

Gross margin analysis can be done by simple arithmetic.

## *How can gross margin be used?*

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### **Note**

Refer to participatory methods to learn non-number based methods of calculating gross margins.

This will make it possible for less literate and numerate farmers to make comparisons; this will assist such farmers in taking better decisions about their farms.

## *How can gross margin be used?*

Gross margin analysis is particularly suitable for farmers who are selling increasing amounts of their farm production in the market place.

Comparisons can be made:

Between farmers

Within the same farm over time

Between different technologies on the same enterprise.



## *How can gross margin be used?*

Gross margin can be used as a planning tool in evaluating the potential value of alternative technologies and/ or enterprises.

This will help farmers make informed decisions about their future farming activities and about opportunities as they present themselves.

## *How can gross margin be used?*

The advantages of gross margin analysis include:

Information required is simple and easily collected

Analysis is easy to complete

Results are easy for both farmers and you  
to understand

## *How can gross margin be used?*

Gross margins ensure that values for non-purchased inputs such as family labour, draft power and manure are included among the variable costs.

When this is done, farmers begin to value these inputs more accurately. This in turn will help them make better decisions about non-purchased inputs.

## *How can gross margin be used?*

The results from the gross margin analysis can be useful in helping:

Farmers decide whether or not to adapt a technology or farm enterprise

Farmers decide whether or not to introduce new market-oriented enterprises

You decide whether or not to encourage farmers to adopt a particular technology or enterprise

## *Calculating a gross margin*

The basic formula for calculating a gross margin is as follows:

$$\text{Gross margin} = \text{Gross income} - \text{Variable costs}$$

## *Gross income ( value of production) for crop enterprises*

Calculating gross income is different for annual crop enterprises and livestock and perennial crop enterprises.

The gross income or value of production is the money received from the sales of produce plus the value of unsold produce.

## *Gross income ( value of production) for crop enterprises*

The gross income is obtained by multiplying the physical output by the farm gate price of the product and valuing home consumption. The farm gate represents the point of first sale.

$$\text{Gross income} = \text{yield} \times \text{farmgate price}$$

## *Gross income ( value of production) for crop enterprises*

It is generally incorrect to calculate gross income for the enterprise by using the price at which the farmer sold the produce in the marketplace or elsewhere off the farm.

If the farm gate price is not known, then it can be calculated by deducting the costs of transportation and other marketing expenses from the market price.



## *Gross income ( value of production) for crop enterprises*

For example, let us say that a farmer had harvested 3 tonnes of cassava.

The farmer sold most of it at the market for \$200/tonne. It cost \$10/tonne to take the cassava to market. There were no other marketing expenses.

## *Gross income ( value of production) for crop enterprises*

The outcome of this is as follows:

The farmgate price was:  $\$200/\text{tonne} - \$10/\text{tonne} = \$190/\text{tonne}$

The gross income was:  $\$190/\text{tonne} \times 3 \text{ tonnes} = \$570$

## *Gross income ( value of production) for crop enterprises*

When farmers are planning, they will not yet have sales, consumption and storage data for the crop which has not yet been planted.

In this case they will want to estimate the gross income.

To do this, they need data about yield and price. If they know that the farm produced 3 tonnes per ha last year and know the average farm gate price was \$200 per tonne, then by using the formula, they can estimate the gross income per ha.

## *Gross income ( value of production) for crop enterprises*

No matter how much farmers sell, consume or store, the value of the crop (gross income) can be determined by multiplying yield by price.

However, a more detailed understanding of gross income highlights that the gross income from an enterprise comprises a number of sources of income:

- Produce sold
- Produce consumed by the farmer's family/workers
- The produce put into storage
- By-products.

## *Produce sold*

The money received from the amount of the farm product sold on the market is part of the gross income of the enterprise.

Gross income from sales is calculated as follows:

Income from sales = Quantity of produce sold × Farmgate price

## *Produce consumed by the farmer's family/workers*

Not all of the product produced on a farm will be sold. Some will be consumed (eaten) by the farm family and / or the workers.

This does not bring in cash directly to the farm, but the product has a value and therefore is included in the gross income. The contribution to gross income from produce consumed is equal to the value of the produce consumed.

## *Produce consumed by the farmer's family/workers*

This value is calculated as follows:

Value of produce consumed = Quantity of produce consumed × Farmgate price

## *Produce put in storage*

Some of the harvest will be stored. This may later be sold or consumed. But either way, it has a value.

The contribution to gross income from produce stored is equal to the value of the produce stored.

This value is calculated as follows:

Value of produce stored = Quantity of produce stored × Farmgate price



## *By-products*

In addition to the main produce, the enterprise may also produce by-products.

An example is stover from maize or the manure from a livestock enterprise.

These by-products can be sold or used on the same or another enterprise.

## *By-products*

In either case, they have value. If some or all of the by-product is sold, the contribution to gross income is equal to the income received from the sale of the by product.

This is calculated as follows:

Income of by-product = Quantity of by-product sold x Price of by-product

## *By-products*

If some of or all of the by-product is used on the farm, the contribution to gross income from by-products is equal to the value of the by-products.

This value is calculated as follows:

Value of by-product used on the farm = Quantity of by product used × Price of by-product

## *By-products*

Thus the total value of the by-product is calculated as follows:

Total value of by-product used on the farm = Income from by-product sold +  
Value of by-product used on the  
farm

# *Gross income*

Therefore, the gross income of an enterprise is calculated as follows:

	Income from sales
+	Value of produce consumed
+	Value of produce stored
+	Value of by products on the farm
<hr/>	
=	Total gross income

## Gross income for crop enterprises; an example

**Gross income of 1 hectare of maize:**

Maize grain sold                      11 bags of 90Kg at \$13/bag     = \$143.00

Grain consumed at home    2 bags of 90Kg at \$ 13/bag    =\$ 26.00

Stover sold as by products 5 tonnes at \$ 9.00/tonne = \$ 45.00

Gross income = \$214.00

## *Gross income for livestock enterprises and permanent crops*

Farming activities for perennial crops (e.g. fruit trees) and livestock enterprises extend over more than a single year.

Here gross income is defined as the difference between the closing valuation of produce stored, plus sales (including marketable produce and by-products consumed on the farm) and the opening valuation of produced stored plus purchases.

On the next slide you can see an example of a gross income calculation format for a livestock enterprise.

Example of a gross income calculation  
for a livestock enterprise format

Item		\$
	Closing valuation (at the end of year)	
-	Opening valuation (at the beginning of year)	
=	<b>Increase/decrease in value of stock (inventory change)</b>	<input type="text"/> (A)
	Income from sales (livestock)	
+	Income from sales (by-products)	
	Value of products used for home consumption	
=	<b>Value of sales and consumption</b>	
-	Purchases of animals (during the year)	
=	<b>Net sales</b>	<input type="text"/> (B)
	<b>Gross income</b>	<input type="text"/> (A+B)



## *Gross income for livestock enterprises and permanent crops*

The gross income calculated for perennial crops uses the same calculation method.

Changes in the values of tree crops and the value of produce stored on the farm would be part of the gross income calculation.

## *Gross income for livestock enterprises and permanent crops*

Since it is possible to produce more than a single short-term crop from the same land area within a year, a distinction needs to be made between gross income for a particular season and gross income for a particular year.

The gross income of a crop for the year may be the sum of the gross income for two or more crops grown during the year.

## *Variable costs*

Costs associated with a farm can be divided into two kinds of costs: variable costs and fixed costs.

Total cost of production = Variable costs + Fixed costs

## *Variable costs*

Variable costs are the costs of actual production. They apply to specific enterprises on the farm.

These costs vary as output changes. These costs occur only if something is produced. They do not occur if nothing is produced.

## *Variable costs*

Typical variable costs include the cost of seeds, fertilizers, sprays, fuel for machines, hired labour, livestock feed, and veterinary costs, among others.

Variable costs can be allocated to specific enterprises.

An example of variable costs for maize is shown on the next slide.

Example  
Variable costs for maize

<i>Item</i>	Unit	Quantity	Unit price (\$)	Amount (\$)
Seed	kg	10	0.90	9.00
Fertilizer	50 kg per bag	1	13.00	13.00
Manure	Tonnes	4	13.00	52.00
Pesticide	kg	4	2.00	8.00
<i>Labour</i>				
Total inputs and materials				82.00
Land preparation	person-days	20	0.70	14.00
Planting/manuring	person-days	10	0.60	6.00
Weeding	person-days	15	0.60	9.00
Harvesting/threshing	person-days	10	0.60	6.00
Total labour				35.00
Total variable costs				117.00

## *Fixed costs*

The fixed costs apply to the farm as a whole.

Fixed costs are costs which do not vary with changes in production output of a specific type of crop or livestock.

Fixed costs remain the same regardless of the output. Even if there is no output, there will still be fixed costs.

## *Fixed costs*

Fixed costs include, for example, the cost of purchasing a tractor or a piece of equipment which is used on the whole farm, and the cost of a head of livestock.

Most of the costs of keeping a tractor, equipment and draft cattle remain the same if the item is or is not fully used.

Fixed costs also include permanent labour, management, and depreciation, among others. (Depreciation is the costs of the declining value of things like tractors, machinery and buildings. Depreciation is usually calculated as an annual payment).



## *Calculating the gross margin*

Costs and income analysis are usually done after the harvesting of the crop at the end of the cropping season or year.

In the case of perennial harvest, yields and prices vary during the year.

Therefore, the time of analysing costs and income should be done for a given crop year. In such cases, it is important that inputs and output refer to the same year being considered for analysis.

## *Calculating the gross margin*

A calculation of a gross margin (using the figures from the previous examples) for 1 ha of maize is shown below.

$$\begin{array}{r} \text{Gross income} \quad \$214.00 \\ \text{Variable costs} - \$117.00 \\ \hline \text{Gross margin} = \quad \$97.00 \end{array}$$

## *Calculating the gross margin : Scaling to units for comparison*

To be able to make comparisons, the gross margin calculations must be made on the same unit basis, such as hectare, labour or water.

If the information available to farmers is for more or less than one unit, then they need to convert it to one unit.

See two examples on the next slides .

# *Example*

## *Farmer 1 with 0.75 hectares of millet*

Source of Income	Quantity (Tonne)	Farmgate price (\$)	Value (\$)
Sales at Market	1.0	200	200
Consumed	0.5	200	100
Stored	0.5	200	100
By- Product	0.2	50	100
<b>Total yield</b>			
Millet	2.0		
By- Prodcut	0.2		
		<b>Gross income</b>	410

*Example*  
*Farmer 1 with 0.75 hectares of millet*

Gross income for the millet enterprise is \$410.  
Suppose variable costs are \$300

Gross income = \$410

Variable cost = -\$300

Gross Margin = \$110

*Example*  
*Farmer 1 with 0.75 hectares of millet*

Gross margin for 0.75 hectares is \$110.

But to make a comparison it is necessary to convert this to a unit basis, in this case 1 hectare;

$$\$110/0.75 = \$147 \text{ per 1ha}$$

Farmer 1 has a gross margin of \$147 per hectare.

# *Example*

## *Farmer 2 with 1.5 hectares of millet*

Source of Income	Quantity ( Ton)	Farm Gate price (\$)	Value (\$)
Sales at Market	2.0	200	400
Consumed	0.5	200	100
Stored	1.5	200	300
By- Product	0.5	50	25
<b>Total yield</b>			
Millet	5		
By- Product	0.5		
		<b>Gross income</b>	825

*Example*  
*Farmer 2 with 1.5 hectares of millet*

Suppose farmer has variable cost of \$700;

Gross income = \$825

Variable cost = -\$700

Gross Margin = \$125



*Example*  
*Farmer 2 with 1.5 hectares of millet*

Gross margin for 1.5 hectares is \$125, but to make a comparison it is necessary to convert this to a unit basis, in this case 1 hectare:

$$\$125/1.5 = \$83.3 \text{ per 1ha}$$

The farmer has a gross margin of \$83.3 per hectare

## *Comparison*

Total gross margin for farmer 1 is less than the total gross margin for farmer 2.

When gross margin is converted on a unit basis, farmer 1 has a higher gross margin, despite the enterprise is smaller.

Although farmer 2 has a larger final income, farmer 1 has a more profitable farm.

With more land, it is likely that farmer 1 would earn more income than farmer 2.

# *Comparison*

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## Note

The unit of measure for a gross margin is usually the unit of the most limiting factor. This may include land, labour, water or money invested.

In the case of crops (and most trees), the unit of measure is normally per hectare (or acre) - that is, based on land.

In the case of livestock, the unit of measure is production per head for livestock and sometimes in the case of trees, the unit of measure is production per tree.

## *Calculating the gross margin : Converting from units to determine actual income*

In many cases, the farmer will obtain gross margin information about a crop where the information is presented on a unit basis.

A farmer who wants to know what the actual gross margin would really be, needs to convert from a unit to the actual size.

To do this the farmer must multiply the per-hectare gross income by the actual number of hectares.

Example: The gross margin for maize in the area is \$200 per hectare

Case 1 : Farmer 1 has 0.8 ha, which yield;  
 $0.8\text{ha} \times \$200/1\text{ha} = \$160$  per 0.8ha

Case 2 : Farmer 2 has 1.6 ha, which yield;  
 $1.6\text{ha} \times \$200/1\text{ha} = \$320$  per 1.6ha

Farmer 1 can expect to have a total gross margin of \$160, while Farmer 2 of \$320.

## *Farm profit*

The farm profit (or whole farm income) is an estimate of the overall profitability of the farm as a whole.

Farm profit is calculated by combining the gross margins of each of the farm enterprises and deducting fixed costs.

The final figure represents the profit or income of the farm.

Whole farm income (profit) = Gross margins of all enterprises - Fixed costs

## *Calculation of whole farm profit; example*

A farmer with 3.5 ha of land has the following gross margins from three enterprises.

## *Example: Gross margins for three enterprises*

Enterprises	Ha	Gross Margin per hectare (\$)	Gross margin (\$)
Millet	1.5	150	225
Maize	0.5	120	60
Groundnuts	1.5	200	300
Total			585



## *Example: Gross margins for three enterprises*

The whole farm gross margin is \$585. To calculate the whole farm profit, the farmer needs to deduct the fixed costs;

Whole farm gross margin \$585

Fixed costs	-\$200
<hr/>	
Farm Profit	=\$385

## *Calculation of whole farm profit; example*

Since fixed costs do not change very much with changes in production, if the farmer can increase the gross margins on the farm, profits will automatically increase.

For this reason it is possible to plan in terms of gross margins and leave the farm profit to look after itself.

Since most small-scale farmers in Africa have very few fixed costs, the gross margin is a very useful indicator of overall farm profit. Farmers need only to plan in terms of gross margins.

# Example of the whole farm gross margin for a farm with livestock and crops

Enterprise	Unit	Gross margin per unit (\$)	Gross Margin (\$)
Millet	1.5ha	150	225
Maize	0.5ha	120	60
Ground nuts	1.5ha	200	300
Goats	2 LSU*	25	50
Total	3.5ha 2 LSU		635
*LSU (Livestock units)			
		Fixed costs	200
		<b>Farm profit</b>	<b>435</b>

# *Calculation of whole farm profit; example*

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## **Note**

The unit for crops is hectares and the unit for the livestock is LSU (livestock units).

The actual gross margin is calculated by multiplying the gross margin per unit by the number of units.

## *Fixed costs and depreciation; an example*

For example, if the total cost of a tractor were added to the other costs of a particular crop in one year, then the enterprise is likely to appear to be unprofitable.

To give a truer picture of profitability, the cost of durable capital items has to be applied over several years. A method is used to spread the costs of durable capital items over their useful life.

It gives us a fairly accurate idea of what it costs to use the item for a year.

## *Depreciation; an example*

The cost of a tractor is \$35 000. It has a useful life of 7 years.

Therefore, each year, one seventh of the cost of the tractor is taken off its value and added to the enterprise costs.

The formula is as follows:

$$\text{Depreciation/year} = \frac{\text{Purchase price (\$)}}{\text{Useful life (years)}}$$

## *Depreciation; example*

$$\frac{\$35\ 000}{7\ \text{years}} = \$5\ 000\ \text{per year}$$

Each year, for seven years, \$5 000 will be a fixed cost to the farm.

This fixed cost remains on a yearly basis until the tractor comes to the end of its life.

# Steps for calculating gross margins

1. Determine an average yield per hectare for the enterprise.
2. Determine the average farm gate price for the enterprise (The farmer or you will need to take the information on prices available in the market and deduct all of the marketing costs from the farm gate to the market.)
3. Calculate the gross income from sales per hectare (i.e. the average yield per hectare multiplied by the price at the farm gate.)



## *Steps for calculating gross margins*

4. Calculate the value of consumed and stored produce.
5. Calculate the non-labour variable cash costs of inputs and materials per hectare for the enterprise. These should include the costs of seeds, fertilizer, pesticides, machinery services etc.

## *Steps for calculating gross margins*

6. Estimate the labour costs per hectare per activity for each enterprise (e.g. land preparation, sowing, weeding, harvesting, etc.).

First: Determine the number of hired person-days required per activity per hectare.

Second: Determine the rate of pay for hired labour.

Third: Calculate the cost of hired labour by multiplying the number of hired person day per activity by the current wage rate for each activity.

## *Steps for calculating gross margins*

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### **Note**

In some countries there is different rate of pay per hectare per activity. If this is the case, then the costs will be calculated per hectare per activity.

In some countries labour is hired at a fixed rate per day. If this is the case, then the costs will be calculated on the total person-days.

## *Steps for calculating gross margins*

7. Calculate the cost of family labour by multiplying the number of family labour person day days per activity by the opportunity cost of family labour (i.e. the current wage rate, as in step 6).
8. Calculate the total variable costs by summing the cost of inputs and materials, hired labour and family labour.

## *Steps for calculating gross margins*

9. Calculate the gross margin per hectare by subtracting variable costs from the gross income.
10. Repeat this calculation for each enterprise on the farm.
11. Compare the gross margins among enterprises and determine which is more profitable.

## *Steps for calculating gross margins*

---

### **Note**

The procedure for calculating the gross margin in terms of returns to labour or per labour-day is similar to the previous procedures except that the total family labour is not included.

Returns to labour are calculated by taking total income less variable costs and dividing by the total labour days used.

$$\text{Return to labour} = \frac{\text{Total income} - \text{Variable costs}}{\text{Total labour days}}$$

## Session 4.3

# Marketing margins

### Learning outcomes:

Understand the purpose and tool in diagnosis

Understand when to use the method

Understand how to carry out the method

# Marketing margins

In this session you will learn the basics of calculating marketing margins. By understanding and knowing how to use such a tool, you will be able to help farmers understand the reason why there are large price differences between what farmers receive and what market prices are.



## *Marketing margins*

Why is the price of a product in a shop or retail market often so much higher than the price paid to the farmer?

Getting a product from the farm to the consumer is part of the marketing process.

Each of the different steps involved in moving produce from the farm to the consumer, along the marketing chain involves costs.

## *Marketing margins*

Traders spend money on transport or packaging but there are many other less obvious costs.

These costs are not always visible; those doing the marketing are often accused of making unreasonable profits.

Farmers look at the prices paid to them by traders and compare them with the prices consumers pay for the same product. They often assume that farmers and consumers are being exploited.

Likewise, consumers often feel prices are too high.

## *What are marketing margins?*

A marketing margin is the difference between the value of a product at one stage in the marketing process and the value of the same product at another stage.

Measuring this margin shows how much has been paid for the marketing services for the product at that stage of the marketing process. It is the added cost of marketing.

## *When are marketing margins used?*

Farmers producing for the market should be aware of the choices that are open to them with respect to marketing.

Calculating marketing costs and margins can help the farmer and/or you decide which marketing procedure will give the best benefit.

Added or marginal costs must result in at least an equal marginal return; otherwise, the market is not profitable.

# *What are marketing costs and how are they calculated?*

Marketing costs are the costs incurred when moving produce from the farm to the market.

There are several stages involved, in each there are costs incurred.

The stages are:

- Produce preparation
- Packaging
- Handling
- Transport
- Storage
- Losses

## *Produce preparation*

The first marketing cost incurred is produce preparation.

This involves cleaning, sorting and grading.

This may be done on or off the farm. Either way, the cost associated with preparation is a marketing cost.

## *Packaging*

The next cost that is normally faced is packaging.

Types of packaging used may range from simple jute bags to plastic packaging for the direct transport of fruits to consumers in supermarkets. This too may be done on or off the farm.

## *Handling*

Handling costs are incurred at all stages of the marketing chain. They include loading and unloading.

Each time a product is handled the cost per kilogram is small, but a product may be handled many times before it reaches the market.

The total of all of these small handling costs can end up being quite substantial.



# *Transport*

Transport costs are incurred by farmers when they take their produce to market.

Sometimes transport costs are very clear because they involve the direct payment by a farmer to the transport owner each time a delivery is made.

In other cases these costs are less direct, for example when farmers own and operate their own vehicles. In the latter case, the farmer needs to determine the running costs of transport per kilometre.

# *Transport*

When the running costs and the quantity of products carried per trip are known, the cost of transport per kilogram or per tonne of product can be calculated.

To calculate transport costs using their own vehicles, farmers need to know:

Vehicle running cost/km (\$/km)

Quantity that can be carried per trip (kg or tonne/trip)

Distance to the market (km)

# Example

## Calculation of transport costs

The farmer has a vehicle that can carry 200kg of produce per trip. The running cost of the vehicle is \$0.50/km. It is 10 km to the market.

Detail	Amount	Unit
A. Running cost for transport	\$0.50	per km
B. Distance to market	10	km
C. Cost per trip (A × B)	\$5.00	per trip
D. Mass/weight per trip	200	kg
E. Cost per kg (C/D)	\$0.025	per kg
F. Cost per tonne ( E × 1000)	\$25.00	per tonne

\* These are the costs per kg or tonne to transport 200kg. If less than 200kg is transported, then the costs will be higher. Thus, one way to reduce marketing costs is to use transport optimally.

# *Storage*

Storage is an important cost for many products. The main purpose of storage is to extend the availability of produce over a longer period than if it were sold immediately after harvest.

The assumption behind storing produce for the market is that the price will rise sufficiently while the product is in store to cover the costs of storage.

The costs of storage will vary, but they are usually very clear because they are paid for directly.

# *Losses*

Losses are common when marketing agricultural produce. Even if nothing is actually thrown away products may lose weight in storage and transit.

Post-harvest losses of produce, particularly fresh produce, can be substantial, both in terms of quantity and quality. This will affect both the amount of product for sale and the selling prices.

The following are common causes of post-harvest (marketing) losses divided in terms of quantity and quality.

# *Losses*

## 1. Quantity-related losses

- Large quantities of the product on the market or 'gluts' (as often happens during the main season) often means that much will be thrown away unsold
- Moisture loss (reduces weight of the product, e.g. grains, fruit and vegetables)

# *Losses*

## 2. Quality-related losses

- Produce damaged while being handled or transported
- Produce deteriorates (including over-ripening) over the period its waiting to be sold
- Moisture loss (particularly with fruit and vegetables)

## *Example; The cost of loss*

A trader purchased 2 kg of green peppers from a farmer at \$5.00/kg.

When the trader gets to market only 1.8 kg are still available for sale (e.g. a loss of 10%).

Marketing costs are an additional \$2.00/kg for the 2kg of green peppers purchased.

The selling price of green peppers is \$9.00/kg.

<u>Quantity lost</u>	<u>Market price of product</u>	<u>Value of loss</u>
0.2 kg	\$9.00/kg	\$1.80



The impact of this loss on the margin to the trader can be calculated as follows:

Activity	Quantity	Price	Total	20 Kg Purchase	
Income from sales	1.8kg	\$9.00/kg	\$16.20	\$162.00	<b>A</b>
Purchases	2kg	\$5.00/kg	\$10.00	\$100.00	
Packing and transport	2kg	\$2.00/kg	\$4.00	\$40.00	
<b>Costs</b>			\$14.00	\$140.00	<b>B</b>
<b>Margin to the trader</b>			\$2.20	\$22.00	<b>(A-B)</b>

## *Example; The cost of loss*

If the trader had prevented the loss, the margin would have been \$4.00 ( $\$2.20 + \$1.80$ ).

This may seem insignificant, but if the trader had purchased 20kg instead of 2kg, the value of the loss would have been \$18.00 and the margin \$22.00 instead of \$40.00.

This is a substantial cost.

## *Other marketing costs*

People using markets may have to pay market fees.

People using markets may have to pay to have the produce weighed.

Traders normally have to be licensed and pay licence fees.

In some markets, wholesalers charge commissions.

Taxes may have to be paid.

Sometimes, bribes are needed to get produce through roadblocks or to get permission to operate a business.

## *More on marketing costs*

There are two types of marketing costs: variable marketing costs and fixed marketing costs.

Variable costs are costs which are incurred if marketing activities are carried out, for example, transport costs from the farm to the market, handling costs, packaging materials, parking fees, commissions based on weight.

## *More on marketing costs*

Fixed costs are costs that will be paid by the farmer whether or not marketing activities are carried out.

Fixed marketing costs include taxes, insurance, fixed rent for the stalls, fixed salary of the workers involved in marketing, depreciation of the trucks, weighing scale and other equipment.

## *Calculations*

Once all the marketing costs have been calculated it is then necessary to put them together to work out the total marketing costs for the farmer.

Marketing margins are related to the prices received for produce.

Costs have to be related to these prices.

## *Calculations*

Farmers selling their produce directly to the market are likely to get different prices at different times of the year and even at different times of the day.

Farmers need to understand how the markets they use operate, because this will affect the marketing margins.

The marketing margin is the difference between the prices farmers receive for their produce and the costs incurred in marketing.

*Example;  
Farmer selling tomatoes  
in the nearest rural market*

100 kg of tomatoes are harvested by the farmer; there is a 10 per cent loss due to damage and other causes.

The remaining tomatoes (90 kg) are sold at the market at the prices shown in the next slide



*Example;  
Farmer selling tomatoes  
in the nearest rural market*

Quantity (kg)	Price per Kg	Income from sales (\$)
50	1.10	55
20	1.00	20
15	0.80	12
5	0.60	3
10	not sold	0
Total income		90

The average selling price per kg is  $\$90/100 = \$0.90/\text{kg}$

## *Example; Farmer selling tomatoes in the nearest rural market*

Other marketing costs charged over the season included the following:

Marketing costs	Amount (\$)
Market fees	1
Handling labour	2
Cost on route	1
Transport	0.50/10 kg per box (0.05/kg)
Packaging	0.50/10 kg per box (0.05/kg)

Given all this information, it is now possible to calculate the marketing margin.

# *Example; Farmer selling tomatoes in the nearest rural market*

Quantity sold	Value (\$/kg)	
0.9 kg x weighted average selling price of \$0.90 per kg	0.81	(A)
<b>Marketing costs</b>		
Market fees	0.01	
Labour employed by farmer to pack, load and unload	0.02	
Cost on route	0.01	
Transport to wholesale market	0.05	
Packaging	0.05	
Total marketing costs	0.14	(B)
<b>Marketing margin</b>	<b>0.67</b>	<b>(A-B)</b>

# *Calculations*

---

## **Note**

The market margin calculation should be conducted on a unit weight basis.

You should be careful to convert all of the items to the same base.

In this example the calculation is carried on a per kilogram basis.

## Session 4.4

# Break-even budgets

### Learning outcomes:

Understand the purpose of the tool  
Understand when to use the method  
Understand how to use the method

# Break-even budgets

This session introduces a tool you can use to help farmers determine break-even points of their enterprises.

The session will define the concept of break-even, will examine a break-even budget and demonstrate how it is calculated.

One use of the tool is to assist farmers becoming price makers, not price-takers.

## *Break-even budgets*

We have previously estimated gross margins, by using average costs and prices that are the only sensible choices, but averages can be deceiving.

Averages represent the common mid-point between two extremes, and therefore give a picture that intentionally does not reflect either case.

## *Break-even budgets*

But what happens when we move away from the average or expected case and toward either of two extremes - the best case or the worst case.

The break-even budget is a tool used to determine the effect of these extreme possibilities.



## *Break-even budgets*

Break-even analysis is a technique for studying the relationship between costs and income at different levels of production and different prices.

A break-even budget estimates the point at which a farm's gross income is equal to its total variable costs

## *Break-even budgets*

On one side, the break-even budget gives an indication of maximum acceptable level of cost. That is, the point at which, if costs increase, the farm will not be profitable.

On the other side, the break-even budget gives the minimum acceptable level of a benefit given an estimated level of cost. That is, the point at which, if the income decreases, the farm will not be profitable.

## *Break-even budgets*

Break-even budget looks at the level of the activity where income equals total cost, so that no profit (gross margin) is made.

Break-even occurs where total variable cost and gross income are equal.

## *Break-even budgets*

One can determine break-even points for yield and market price. The break-even essentially answers the following questions:

**Yield:** Given a known price and cost, at what level of production (yield) would the farm 'break even' (costs equal income)?

**Price:** Given a known yield and cost, at what market price would the farm 'break even' (costs equal income)?

## *Break-even budgets*

Calculating break-even budgets in price and yields can help a farmer plan enterprises, particularly when the farmer is considering making a change in production/commodities (yield), inputs/mechanization (cost), or markets (price).

For example, a farmer might be interested in substituting one variety of tomato for another.

## *Break-even budgets*

If the production potential of the new variety is unknown, a break-even budget is constructed to estimate the minimum yield that would have to be achieved to make the change worthwhile.

Alternatively, if the expected yield is known but the price is not, the budget could indicate the minimum price that must be obtained to make the change economically feasible.

Cost variations could also be explored for the new variety using the break-even budget.

## Example; Gross margin for 1 ha of maize, Kenya

Item	Unit	Quantity	Unit price (Ksh)	Amount (Ksh)
------	------	----------	------------------	--------------

### *Income*

Maize yield	Bag (90 kg)	20	1 000	20 000
Stover	Load	1	400	400

**Total income** 20 400 (A)

### *Variable costs*

Seed	kg	10	70	700
Fertilizer	50 kg bag	1	1 000	1 000
Manure	Tonnes	4	1 000	4 000
Pesticide	kg	5	100	500
Land	Person-days	18	50	900
Planting/ manuring	Person-days	10	50	500
Weeding	Person-days	16	50	500
Harvesting/ threshing	Person-days	8	50	400

**Total variable costs** 8 500 (B)

**Gross margin** 11 900 (A-B)

Break-even yield (BY) is the yield required to recover all the costs incurred in production at given prices of the product and given input costs. The formula for calculating the break-even yield of a given enterprise is:

$$\text{Break-even yield/ha (BY)} = \frac{\text{Total variable cost/ha}}{\text{Product price}}$$

So break-even yield for the previous example is;

$$\text{Break-even yield/ha (BY)} = \frac{\text{Ksh 8 500/ha}}{\text{Ksh 1 000/bag}}$$

$$\text{Break-even yield/ha (BY)} = 8.5 \text{ bags/ha}$$



## *Example*

### *Gross margin for 1 hectare of maize, Kenya*

From the data presented, the break-even yield for the Kenyan maize farm is 8.5 bags per hectare.

If the actual maize yield is higher than 8.5 bags per ha (the break-even yield), it will be profitable for the farmer to grow maize.

Conversely, if maize yield is lower than its break-even yield (8.5 bags per ha), the farmer will incur a loss if he/she grow this crop.

## *Determining the break-even price*

Break-even price of the product is the product price needed to recover all variable costs incurred in production at a given output level and cost of input.

## *Determining the break-even price*

$$\text{Break-even price/bag (BP)} = \frac{\text{Total variable cost/ha}}{\text{Expected yield/ha}}$$

$$\text{Break-even price/bag (BP)} = \frac{\text{Ksh 8 500 /ha}}{20 \text{ bags/ha}}$$

$$\text{Break-even price/bag (BP)} = \text{Ksh 425/bag}$$

## *Determining the break-even price*

The break-even price of maize is Ksh 425 per bag. This means, if the price of maize is above the break-even price, it will be profitable to grow maize.

If the price of maize falls below Ksh 425 per bag, maize farmers will sustain a loss if they grow maize.

# Session 4.5

## Sensitivity analysis

### Learning outcomes:

Understand the purpose of the tool  
Understand when to use the method  
Understand how to use the method

# Sensitivity analysis

This session introduces a tool you can use to help farmers make more informed decisions to deal with risk. The tool analyses the sensitivity of an enterprise to changes in such factors as yield, input and market price.

## *What is sensitivity analysis?*

Sensitivity analysis is an instrument that can help farmers analyse the sensitivity of an enterprise to changes in factors such as yield, input price and market price.

It can be used to identify the critical variables and their effect on projected profitability.

## *What is sensitivity analysis?*

The tool helps answer the question: "What if...?" or "What would happen if?"

What if our production decreases or increases?

What if the price of our product goes up or down?

What if the cost of an input changes?

What if the family increases the amount of crop it consumes?



## *What is sensitivity analysis?*

This technique quantifies the outcome of a change in a single or combination of selected variables that effect enterprise profitability.

Sensitivity analysis can be used with any of the farm business planning and management techniques that we have discussed to date to help make decisions on the farm.

# *What influences enterprise profitability?*

Yields may be only one of the factors which influence enterprise profitability. Others include:

The amount of harvest which is marketed, rather than consumed on the farm

The price received for produce sold

The prices of inputs

## *What influences enterprise profitability?*

Where maize and other food crops are concerned, the amount of produce marketed by the farmer may be even more variable than yields.

This is because the farmer markets only that portion of the food crop that is not required for on-farm consumption.

If yields decrease, on farm consumption may remain almost the same because the farmer will first reduce the amount of produce marketed before reducing on-farm consumption.

## *What influences enterprise profitability?*

Yields and prices tend to move in opposite directions for food crops.

When yields fall, there is a scarcity of the crop and prices tend to rise.

When yields rise there is an abundance of the crop and prices tend to decline.

## *What influences enterprise profitability?*

The movement of prices and yields in opposite directions means that the enterprise budgets vary less than they would if prices were held constant or moved in the same direction as yields.

Thus, yields, on-farm consumption and prices together influence the farmer's gross margin. This makes sensitivity analysis a very useful tool to apply

## *What influences enterprise profitability?*

This is illustrated by way of a simple farm budget example that compares the situation in a normal rainfall year with the situation in a bad year.

The normal year enterprise income is assumed to be \$320

## *Example; rainfall*

A simple farm budget that compares the situation in a normal rainfall year with the situation in a bad year.

In a low rainfall, 'bad year', production falls by 50%, but on farm consumption requirements remain the same. Consequently, the quantity of produce marketed also decreases.

Prices subsequently rise but the farmer's cash receipts are still greatly reduced

## *Example; rainfall*

	<i>Normal Year</i>	<i>Bad Year</i>
Produce yield (tonnes)	10	5
Produce consumed on-farm (tonnes)	2	2
Marketed produce (tonnes)	8	3
Farm gate price per tonne	40	55
Total enterprise cash income	320	165



## *Example; rainfall*

The information on yields, consumption and prices under the 'bad year' scenario provides one element of the total farm cash income.

Cash expenditures may also change in a 'bad year' depending on when the low rainfall occurs. At different times in the season, low rainfall will affect different activities.

## *Example; rainfall*

When low rainfall is noted before the crop is planted and continues throughout the crop season, a farmer may anticipate the effects shown on the next slide;

## *Example: rainfall and its effects*

Area of effect	Effect
Yield	Decrease
On-farm consumption of crop	No change
Product price	Increase
Land preparation cost	Decrease
Application of materials used in planting	Decrease
Application of materials used after planting	Decrease
Cost of purchased materials purchased used in planting	Decrease
Cost of purchased materials purchased used after planting	Decrease
Harvest Costs	Decrease

## *Example; rainfall*

If, however, the poor rains come only later in the season after the crop is in the ground, the following effects can be expected;

## *Example; rainfall and its effects*

Area of effect	Effect
Yield	Decrease
On-farm consumption of crop	No change
Product price	Increase
Land preparation cost	Decrease
Application of materials used in planting	No change
Application of materials used after planting	Decrease
Cost of purchased materials purchased used in planting	No change
Cost of purchased materials purchased used after planting	Decrease
Harvest Costs	Decrease

## *Example ; Applying a sensitivity analysis*

A maize farmer expects to generate a profit of Ksh 11 000 over the next year.

The farmer is concerned because a neighboring farm has suffered from a disease which has decreased crop yields by 25%.

The question the farmer needs to answer is:

"How will my profits change if my crop gets the same disease?"

*The following data is given about the farm*

Current yield of maize	20 bags
Price of maize	Ksh 1 000
Total variable costs	Ksh8 700
Gross margin	Ksh11 300
Harvesting cost per bag	Ksh20

## *Example; Applying a sensitivity analysis*

---

### **Remember**

The sensitivity analysis is used to calculate the change in gross margin that could occur following changes in selected key variables which affect profitability.

In this case yield could change and the farmer's wants to determine how this will affect income and profits.



1. We calculate the change in the margin for maize in the event of the farmer's crop getting the same disease as the neighbour's crop.

**Reduction in yield = current yield + % reduction**

The implications are a 25% reduction in yield and the costs saved as a result of the drop in production

**Reduction in yield = 20 bags × 25% reduction**

**Reduction in yield = 5 bags**

2. We calculate the decrease in gross income as a result of the reduced yield.

**Lost gross income = reduction in yield × commodity price**

**Lost gross income = 5 bags × Ksh 1000/bag**

**Lost gross income = Ksh 5000**

3. We calculate the variable costs saved by the reduced yields. In this case the only variable cost affected by yield is the harvesting cost.

**Reduced variable costs = reduction in yield x cost of harvesting**

**Reduced variable costs = 5 bags x Ksh 20/ bag**

**Reduced variable costs = Ksh 100**

4. We calculate the overall reduction in gross margin

**Reduction in gross margin= lost gross income- reduced variable costs**

**Reduction in gross margin= Ksh 5000 - Ksh 100**

**Reduction in gross margin = Ksh 4900**

5. Calculate the new gross margin based on the projected loss in yield.

**New gross margin = original gross margin - reduction in gross margin**

**New gross margin = Ksh 11 300 - Ksh 4 900**

**New gross margin = Ksh 6 400**

## *Conclusions*

A 25% reduction in the yield of maize results in a 56.6% decrease in gross margin.

The conclusion is that the margin generated appears to be extremely sensitive to the problem and that appropriate management time should be devoted for its prevention.

## *Link to assessing risk and vulnerability*

Sensitivity analyses can help a farmer determine how vulnerable they are to risks.

Using results from the sensitivity analyses and comparing them with break-even figures will provide even more about vulnerability to risk.

Farmers will have an idea of the risk boundaries of their farm. This is very useful farm management information to have when making decisions.

## Session 4.6

# Planning for food requirements

### Learning outcomes:

Understand food requirements  
Understand how to do the calculations



# Food requirements

This session introduces a tool you can use to help farmers and their households determine the quantity of food required to produce, for the household and for the market.

It is an important tool to help optimize land use and increase profitability , while not compromising the basic food security for the farm family.

# Planning for food needs

For most farm families in Africa, self-sufficiency in food is the first objective. Consequently food production is a main objective for the farm.

Self-sufficiency in food can either be obtained from the farm harvests or by use of cash. A majority of family farmers in Africa still prefer to produce their own coarse food needs.

Coarse food is basic carbohydrate foodstuffs like maize, root and tuber crops, sorghum, millet and rice.

## *Planning for food needs*

Coarse foods are differentiated from other foodstuffs such as oilseeds, vegetables, fruit, fish, meat, dairy products and others. These are of higher per unit value, but are needed in smaller quantities.

They are either produced or gathered on or around the farm or purchased on the market. Although they are of great importance for the qualitative value of nutrition, only coarse foodstuffs are taken in consideration in this session.

## *Planning for food needs*

Families who suffer from food insufficiency generally also suffer from malnutrition.

It is important to note that having sufficient coarse grains is only one part of food security.

Food security also includes access to other important food groups.

## *Food and market-oriented farming*

As farmers become more market-oriented they need to keep in mind the family's food requirements.

Can they risk growing only for the market and buying all the family's food?

Should they grow some food for their family and some crops to sell?

How much of their land should be planted to food crops for the family?

How much land can be planted to crops to be taken to the market?

## *Food and market-oriented farming*

To decide, the farmer first needs to know how much food the family will need for the year.

The amount of food (coarse grains) an average person (child or adult) needs per day is 0.65 kg. This works out to about 240 kg per year.

Therefore, the farmer simply needs to multiply 240 kg times the number of family members to know how many kilograms of coarse grains will be needed each year to feed the family.

See the next slide for the food requirements table.

Family size (People)	Food required each day (kg)
1	240
2	480
3	720
4	960
5	1 200
6	1 440
7	1 680
8	1 920
9	2 160
10	2 400

## *What to grow?*

Now that the farmer knows how much food the family is going to need each year, two things are required:

- (i) What grains they want to eat
- (ii) Whether to grow these grains or buy them using money from crops sold on the market.



*What grains do they want to eat?*

This is a matter of personal preference and a matter of what is available.

## *Grow food or buy food?*

### **Buying food.**

Can the crop planted for the market make enough profit to feed the family?

Risk can be reduced by:

Investigating the market and learning about what crops get what prices

Investigating access to the market in terms of roads, transport and facilities

Honestly assessing family farming skills; what can be grown confidently?

## *Grow food or buy food?*

### **Growing food.**

This is limited by what crops can be grown in the area and the knowledge needed to grow.

Again there is a risk.

Will the crops planted for food grow?

Can risk be reduced by making a careful calculation of family food needs and then converting this into hectares?

## *Grow food or buy food?*

You should be prepared to advise farmers on food crop options.

Eventually a decision will have to be made.

Let us take a case where a farmer has chosen to grow all the food for family needs and to grow other crops to sell.

# *How much land is needed for planting food?*

The amount of land the farmer needs depends on:

The total amount of food needed

The types of crops to be grown

The expected yields of the chosen crop (s).

*Example;*  
*A farmer with a family of 6 people*

Sarah calculates that she will need 1 440 kg of grains to feed the family for the year.

She has 2.5 ha of land for planting. They are in two parcels.

One is 1.8 ha and the other is 0.7 ha. Her crop choices are millet and maize.

She wants to have them in equal quantities for her family.

*Example*  
*A farmer with a family of 6 people*

In other words, she wants 720 kg of millet and 720 kg of maize to give her the 1 440 kg.

She knows she can get 3 tonnes per hectare growing maize and 0.75 tonnes per hectare growing millet.

How much land does she need to plant to maize?

How much to millet?

# Maize

Sarah knows that 1 ha of maize will give her 3 tonnes. This is the same as 3000 kg. She wants only 720 kg.

If she can get 3000 kg from 1 hectare ...

$$\frac{3\ 000\ \text{kg}}{1\ \text{ha}}$$

How many hectares does she need to get 720kg?

$$\frac{720\ \text{kg}}{X\ \text{ha}}$$

We can set these equations equal to each other ...

$$\frac{3\ 000\ \text{kg}}{1\ \text{ha}} = \frac{720\ \text{kg}}{X\ \text{ha}}$$



## *Maize*

$$3\ 000\ X = 720$$

$$X = \frac{720}{3\ 000} = 0.24$$

Therefore, Sarah needs to plant 0.24 ha of maize.

This is very close to 0.25 or  $\frac{1}{4}$  hectare.

# *Maize*

Let's check the answer:

If she plants 0.25 ha or  $\frac{1}{4}$  ha of maize, she can expect 0.25 or  $\frac{1}{4}$  of the yield.

$$0.25 \text{ ha} \times 3\,000 \text{ kg/ha} = 750 \text{ kg}$$

Therefore, if she plants  $\frac{1}{4}$  hectare of maize, she will have enough maize to feed her family.

## *Millet*

Sarah knows that 1 ha of millet will give her 0.75 tonnes of millet. This is the same as 750 kg. She needs 720 kg.

The calculations are similar to those for maize.

$$\begin{array}{rcl} \frac{750 \text{ kg}}{1 \text{ ha}} & \frac{720 \text{ kg}}{X \text{ ha}} \\ 750 X = 720 \text{ ha} \\ X = 0.96 \text{ ha} \end{array}$$

## *Millet*

This means she should plant 0.96 ha.

This is almost 1 ha.

So now Sarah knows that she must plant 0.25 ha of her land to maize and 1 ha of her land to millet.

## *Millet*

In order to make sure her family has the food they need for the year she will use 1.25 ha of her land.

Her total land size is 2.5 ha.

After planting the maize and the millet, she will have 1.25 ha (2.5 - 1.5 ha) left to plant to crops for the market.

# *Millet*

To make the decision of what to plant on the remaining 1.25 hectares, the farmer can use the enterprise budgets to calculate gross margins. In addition, she will also want to:

Look at opportunity costs and risk

Plan her market

Check on the sustainability of the input/output support for different crop choices

Check on her labour

## *Food flow planning*

In addition to understanding the quantity of food required in a year, it is also important to know when there is likely to be a shortage of food.

This can be done through a simple matrix exercise in which the family consults about when different foods are available and when they are not.

The following matrix is an example for a food flow.

*Example;*  
*Food flow for a family of 6*  
*(coarse grain requirement: 1 140kg)*

Months	J	F	M	A	M	J	J	A	S	O	N	D	
													Total
Foods													
Maize (Kg)	80	80	0	0	0	80	80	80	80	80	80	80	720
Sorghum (Kg)	90	40	40	35	35	65	65	65	65	65	65	90	720
Total	170	120	40	35	35	145	145	145	145	145	145	170	1440
Coarse Grain Requirement (Kg)	120	120	120	120	120	120	120	120	120	120	120	120	1440
Shortfall/surplus	-50	0	-80	-85	-85	25	25	25	25	25	25	50	0



# *Food flow planning*

---

## **Note**

In the food flow matrix quantities can also be expressed in bags

## *Food flow planning*

This food flow shows that this family has a shortfall of grains in the months leading up to the harvest.

An investigation would highlight that one of the reasons they have this shortfall is because they consume too much each month.

A causal diagram would help the family identify why it is consuming more than is needed.

## Session 4.7

# Labour planning

### Learning outcomes:

Understand the purpose of the seasonal labour calendar

Understand when and how to apply the seasonal labour calendar

Understand the use in identifying solutions

Understand the impact of stresses and shocks on labour

# Labour planning

In this session you will learn about a tool that will help farmers analyse their labour needs against their labour availability. If labour is not planned it will affect profits.

The session will define labour analysis, when it is used and how to carry it out. It will also examine the effect of changes on the labour balance over the season and explore suggested solutions.

## *Labour planning*

Labour refers to the people who do the physical work on the farm.

All farms need labour to carry out basic activities of farming.

Pre-production activities, production activities, and marketing activities all require someone to do the work.

## *Labour planning*

Labour can be provided in kind (without pay) by the family.

It can be hired or it can be secured through a social capital arrangement.

Labour costs are often a high percentage of the total costs of production.

Therefore, it is important to plan carefully the use of family, hired and social labour.

# *Labour planning*

The use of labour can be planned on two levels;

Individual enterprise

The whole farm.

Labour planning for the individual enterprise is used to improve the performance of the different operations associated with the enterprise and to ensure that the right number of workers are engaged when required.

## *Labour planning*

At the farm level, use of labour throughout the year is assessed.

The planning of labour for an individual enterprise affects the labour for the whole farm.

The two are closely linked.



## *Labour planning*

If a farmer makes any change which affects labour in an individual enterprise, the farmer will need to examine the impact of this change on the labour requirements and resources for the whole farm.

Similarly, if there is some change to the overall farm operation, the farmer will need to examine the impact on the individual enterprises.

## *Labour planning*

A tool often used to analyse labour requirements and resources is to use a seasonal labour calendar.

This calendar can give a visual assessment of labour on individual enterprises and on the farm as a whole, over a given period of time (e.g. month, season, cropping cycle, year).

## *Procedure for a seasonal labour calendar*

The procedure for constructing the labour seasonal calendar is as follows:

1. List the different farm activities to be undertaken during the year or at a particular season by the family.
2. List the household activities to be done also during the year or the season.

## *Procedure for a seasonal labour calendar*

---

### **Note**

In most cases in Africa, women work both on the farm and in the household. Therefore it is essential that planning for farm labour include the household.

This will give a clearer picture of the total demand for labour by a farming household.

Alternatively the labour planning could also be broken down by gender.

## *Procedure for a seasonal labour calendar*

3. Assess the labour requirements required for each enterprise and household activity.
4. Assess the person-days required
5. Assess family members who will be available to work both for household and farm activities at different periods of the year.

## *Procedure for a seasonal labour calendar*

6. Calculate the person-days available per month
7. Examine the labour supply based on the availability of family members and labour shortages or where additional labour is required.
8. Formulate a strategy for dealing with labour shortfalls and surpluses (labour peaks and troughs).

## *Procedure for a seasonal labour calendar*

It is important to consider the peaks and troughs of seasonal labour availability in relation to the farm labour requirements.

By modifying the cropping pattern and making changes to the enterprise operations it is possible to achieve a better allocation of labour and ensure its more efficient use.

## *Procedure for a seasonal labour calendar*

Periods of trough can be used for general farm maintenance or to generate income through off-farm activities.

Labour requirements during the peak periods could be met through the employment of either part-time or casual work or alternatively the introduction or use of more efficient mechanization or drought power.



**Example**  
**Seasonal labour calendar in person days for labour required**  
**(1 ha maize, 1 ha sweet potatoes and 10 livestock on communal land)**  
**Assumes farm family can work 26 days per month**

Months	J	F	M	A	M	J	J	A	S	O	N	D
--------	---	---	---	---	---	---	---	---	---	---	---	---

*Farm activities*

													Total
Buying inputs		4					4						8
Ploughing			8							8	8		24
Planting				10							10	10	30
Weeding	10	10		10	10						10	10	60
Fertilizing				14						14	14	14	56
Herding cattle	24	24	24	24	24	24	24	24	24	24	24	24	288
Harvesting					30	46	30				30	30	166
Remove stover							3					5	8
Marketing					8	8	8				8	8	40
Farm maintainance	4	4	4	4	4	4	4	4	4	4	4	4	48
<b>Total farm labour</b>	<b>38</b>	<b>42</b>	<b>36</b>	<b>62</b>	<b>76</b>	<b>82</b>	<b>73</b>	<b>28</b>	<b>28</b>	<b>50</b>	<b>108</b>	<b>105</b>	<b>728</b>

## Example...continued

Months	J	F	M	A	M	J	J	A	S	O	N	D
--------	---	---	---	---	---	---	---	---	---	---	---	---

### *Household activities*

													Total
Fetching water	5	5	5	5	5	5	5	5	5	5	5	5	60
Fetching firewood and fuel	3	3	3	3	3	3	3	3	3	3	3	3	36
Food preparation	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6
Cleaning	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6
Tending to children	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6
House repairs	0	0	0	1	0	0	1	0	0	0	1	0	3
Total household labour	9.5	9.5	9.5	10.5	9.5	9.5	10.5	9.5	9.5	9.5	10.5	9.5	117
<b>Total labour required (person-days)</b>	<b>47.5</b>	<b>51.5</b>	<b>45.5</b>	<b>72.5</b>	<b>85.5</b>	<b>91.5</b>	<b>83.5</b>	<b>37.5</b>	<b>37.5</b>	<b>59.5</b>	<b>118.5</b>	<b>114.5</b>	<b>845</b>
Family members available	5	3	3	4	4	3	4	3	4	4	4	5	46
Family members available (person-days)	130	78	78	104	104	78	104	78	104	104	104	130	1 196
<b>Additional labour requirements (person-days)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13.5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

## Session 4.8

### Cash flow

#### **Learning outcome:**

- Understand the purpose of the tool
- Understand when and how to apply the tool
- Understand its use in identifying solutions
- Understand the impact of changes on cash
- Understand farm and household income and expenses
- Understand the timing and volume of cash short fall and ways of addressing them

# Cash flow

In this session you will be introduced to the concept and practice of developing a cash flow, this will enable you to help farmers where their money goes and where it comes from.

This puts farmers in a better position to control their financial situation.

# What is a cash flow?

Gross margin is a tool to assess the profitability of an enterprise.

Gross margin indicates how worthwhile a change may be if the quantities and prices assumed are realized.

When a new enterprise is introduced into the farming system a gross margin is usually prepared to assess whether the enterprise generates enough income to cover expenditures. But this is only a part of the analysis.

## *What is a cash flow?*

It is also useful to assess the overall effect of the enterprise on the household finances.

To do this, the farmer needs to prepare a cash flow.

The cash flow is simply the flow of money into the farm from sales and the flow of money out of the farm through purchases and other payments.

## *What is a cash flow?*

Common to prepare a cash flow for a farm or business enterprise; in the case of smallholder farm families, it is more useful to include the household in the cash flow calculations.

Farmers can use cash flow to determine the financial performance of their households as a whole.

It helps to assess whether the family will have enough money to carry out their plan or if they will be short of money in any month.

Enables the farmer to find the time of the year where additional financial resources may be required.

## *What is a cash flow?*

There is an important difference between a gross margin and a cash flow.

The gross margin looks at the overall performance of the farm and its enterprises, in a cash flow, only actual cash income is included.



## *What is a cash flow?*

The difference is important because although an enterprise may be profitable in terms of gross margin, if the farmer is not selling enough of the crop, then the cash needed to pay inputs, hired labour and other cash costs may not be generated.

## *Net cash flow*

The net cash flow is the difference between the cash inflows and cash outflows.

Net cash flow is calculated by subtracting the money (cash) spent over the year from the money received. (Non-cash items like crops consumed by the family, unpaid family labour, depreciation are not included in the flow of cash.)

$$\text{Net cash flow} = \text{cash inflow} - \text{cash outflow}$$

# *Cash inflow*

**Cash inflow is made up of:**

Sales of produce marketed

Income from wage labour and other employment

Gifts

Loans

## *Cash outflow*

**Cash outflow is made up of :**

Purchases and payments for inputs for the farm (e.g. hired labour, fertilizers, seed, pesticides, animal feeds, salt licks, etc)

Land preparation costs, purchase of new machinery and other operational costs.

Household expenses (e.g. medicine, food, school fees, taxes, gifts).

## *Net cash flow*

The farm should try to generate a positive cash flow.

This comes about by ensuring that more cash flows into the farm than out of the farm.

Analysis of a farm cash flow generates a detailed projection of the farmer's ability or inability to finance an enterprise.

In the absence of records, details of household expenditure usually have to be estimated.

## *Use of cash flow*

Farmers can use a cash flow to analyse their farms, monitor farm activities and plan for the future.

Controlling the flow of cash in and out of the farm is an important task of the farmer.

# *Use of cash flow*

Cash flow budgets are important in:

Developing the farm plan

Choosing between alternative farm enterprises

Comparing actual and budgeted results (to enable corrective action to be taken on time)

Arranging for loans.

## *Use of cash flow*

As a planning tool, the cash flow can be used to see the effect of a small change on the farming system or the financial impact of a complete farm plan.

It can be used to examine whether financing is available within the farm household, or alternatively if there is a need to take out a loan.

In cases where the farmer has already decided to take a loan, the cash flow will also indicate whether and when the interest and debt can be repaid.



## *How to construct a cash flow*

The main feature of a cash flow is that it focuses specifically on cash.

The non-cash items included in gross margin analysis are not included in a cash flow.

Non-cash items include items such as depreciation, the value of family labour and food consumed at home are excluded.

## *How to construct a cash flow*

The cash flow for smallholder farmers includes the on-farm and off-farm (household) inflows and outflows.

It needs to cover;

All cash income and expenditures for the farm household

Include loans that the farm household receive from moneylenders, friends and lending institutions as cash inflows

Include repayment of these loans (principal and interest) as cash outflows.

## *How to construct a cash flow*

A cash flow can be calculated on a monthly, quarterly or annual basis.

Annual cash flows are common for longer term investments such as livestock and tree crops.

Monthly and quarterly cash flows are well suited to annual crops.

A farmer can construct a cash flow on what they are currently doing or they can construct a cash flow on the basis of what they intend to do over the next year.

## *How to construct a cash flow*

A farmer can construct a cash flow on what is currently being done or on the basis of what is intended over the next year.

In the example that follows, we will construct a cash flow budget to examine the projected cash situation of a plan to introduce a new enterprise.

We will look at cash flow on a monthly basis over one year.

## *How to construct a cash flow: An example*

Let us imagine a farm household that earns some income from selling maize and cassava and rearing dairy cows. They also have some chickens.

The family has three children attending school.

The farmer wishes to introduce beans into the system, and knows that the enterprise is profitable but wonders whether there are enough funds to finance the enterprise.

## *How to construct a cash flow: An example*

When the farmer plans the farm programme for next year, the farmer wants to find answers to the following questions:

## *How to construct a cash flow: An example*

How much money are the farm enterprises likely to generate and how much cash expenditure will be needed to cover costs?

When will they receive the money (inflow) and when will the money be needed (outflow)?

If the amount of money they expect to receive over the year does not cover the amount needed, how can they make up the difference? Will it be made up by savings? Do they have reserves? Do they have access to loans?

# 1. Identify Inflow and Outflow

Cash inflow			Cash outflow		
Description	Month	Income (\$)	Description	Month	Expenditure (\$)
Sale of maize	January	270	Money spent on farm inputs (maize)	March	300
	March	300		September	300
	September	300	Money spent on farm inputs (cassava)		
	October	100			37
	November	100	Money spent on farm inputs (livestock)	January	30
Sale of cassava	April	340		February—September	400
	August	120		October—December	90
Sale of milk	March—September	420	Brooding cost and feeding (chickens)	September	60
			Money spent on input (beans)	April	200
Sale of chicken	January	130		May	50
				July	40
Planned sale of beans	July	450		October	180
	December	400		December	40
			Money to cover living expenses	January—December	120
			Money to cover school expenses	February	200
				May	140
				September	100
			Money to cover health expenses	January—December	120
Total		2 990	Total		2 407



## 2. Prepare a cash flow table: Money coming in

<b>MONEY COMING IN</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Sales of farm products:</b>												
Maize	270		300						300	100	100	
Cassava				340				120				
Milk			60	60	60	60	60	60	60			
Chicken	130								60			
Planned sale of French beans							450					400
<b>Total Cash Inflow</b>	<b>400</b>	<b>0</b>	<b>360</b>	<b>400</b>	<b>60</b>	<b>60</b>	<b>510</b>	<b>180</b>	<b>420</b>	<b>100</b>	<b>100</b>	<b>400</b>

## Prepare a cash flow table: Money going out

MONEY GOING OUT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Payments &amp; Purchase of inputs:</b>												
Maize inputs			300						300			
Cassava inputs				37								
Farm inputs livestock	30	50	50	50	50	50	50	50	50	30	30	30
Chicken feeding expenses									60			
Beans inputs				200	50		40			180		40
<b>Household expenses:</b>												
Living expenses	10	10	10	10	10	10	10	10	10	10	10	10
School fees		200			140				100			
Hospital Expenses	10	10	10	10	10	10	10	10	10	10	10	10
<b>Total Cash Outflow</b>	<b>50</b>	<b>270</b>	<b>370</b>	<b>307</b>	<b>260</b>	<b>70</b>	<b>110</b>	<b>70</b>	<b>530</b>	<b>230</b>	<b>50</b>	<b>90</b>

### 3. Calculate the monthly net cash flow

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Total Cash Inflow</b>	<b>400</b>	<b>0</b>	<b>360</b>	<b>400</b>	<b>60</b>	<b>60</b>	<b>510</b>	<b>180</b>	<b>420</b>	<b>100</b>	<b>100</b>	<b>400</b>
<b>Total Cash Outflow</b>	<b>50</b>	<b>270</b>	<b>370</b>	<b>307</b>	<b>260</b>	<b>70</b>	<b>110</b>	<b>70</b>	<b>530</b>	<b>230</b>	<b>50</b>	<b>90</b>
<b>Monthly Net Cash Flow</b>	<b>350</b>	<b>-270</b>	<b>-10</b>	<b>93</b>	<b>-200</b>	<b>-10</b>	<b>400</b>	<b>110</b>	<b>-110</b>	<b>-130</b>	<b>50</b>	<b>310</b>

## 4. Calculate the cumulative net cash flow

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Monthly net Cash Flow</b>	350	-270	-10	93	-200	-10	400	110	-110	-130	50	310
<b>Cumulative balance</b>	350	80	70	163	-37	-47	353	463	353	223	273	583

## 5. Analyze the net cash flow

The farmer could decide not to introduce beans

The farmer could try to save some money in order to cover the financial shortfall

The farmer might decide to cut back on some of the inputs used for growing beans

The farmer might decide to reduce some of the area under maize and cassava in order to reduce costs

The farmer might sell some of his livestock to cover the financial gap

The farmer might decide to take a loan to cover the shortfall

## *Example; using a loan*

Assume that farmer Bill decides to finance the shortfall with a loan, Bill needs to determine how much of a loan is needed and whether and when payments could be made to repay the loan.

The shortfall which cannot be covered amounts to \$104.

## *Example; using a loan*

A loan of \$200 would ensure the cash flow required.

If Bill is to repay the loan over four months and is charged a rate of 18% interest, Bill will make 4 payments of \$59 each. The total repayment would be \$236.

How a loan and repayment schedule could be planned to make this proposal feasible.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly Balance	350	-270	-10	93	-200	-10	400	110	-110	-130	50	310
Proposed Loan				200								
Proposed Repayments							-59	-59	-59	-59		
Cumulative Balance	350	80	70	263	163	153	494	545	376	187	237	547



## *Example; using a loan*

### Assumptions:

loan of \$200 paid back over 4 months

grace period of two months

interest rate at 18%

payable at four equal instalments

## *Example; using a loan*

In this example, if farmer Bill took out a loan of \$200 , Bill would cover the financial shortfall and would have the funds available to repay the loan.

The cumulative balance would then be positive for the entire twelve-month period showing that there is no more need for finances.

## *Example; using a loan*

Where loan options are viable it is necessary to understand that taking out a loan is treated as an inflow, but the cost of repayment (principal and interest) also needs to be taken into account and is treated as an outflow.

In conclusion farmer Bill should be confident that introducing beans into the farming system is profitable and by taking a loan would also be financially feasible.

The final decision rests with him.

# Example of a complete cash flow budget

		J	F	M	A	M	J	J	A	S	O	N	D
		<i>Sales of farm products</i>											
Money coming in	Maize	270		300						300	100	100	
	Cassava				340				120				
	Milk			60	60	60	60	60	60	60			
	Chicken	130								60			
	Beans (planned)							450					400
Total cash inflow		400	0	360	400	60	60	510	180	420	100	100	400
		<i>Payments and purchase of inputs</i>											
Money going out	Maize inputs			300						300			
	Cassava inputs				37								
	Farm inputs livestock	30	50	50	50	50	50	50	50	50	30	30	30
	Chicken feeding expenses									60			
	Beans inputs				200	50		40			180		40
		<i>Household expenses</i>											
Living expenses		10	10	10	10	10	10	10	10	10	10	10	10
School fees			200			140				100			
Hospital expenses		10	10	10	10	10	10	10	10	10	10	10	10
Total cash outflow		50	270	370	307	260	70	110	70	530	230	50	90
Total cash inflow		400	0	360	400	60	60	510	180	420	100	100	400
Total cash outflow		50	270	370	307	260	70	110	70	530	230	50	90
Monthly net cash flow		350	-270	-10	93	-200	-10	400	110	-110	-130	50	310
Cumulative balance		350	80	70	163	-37	-47	353	463	353	223	273	583

## Session 4.9

# Records

### **Learning outcomes:**

- Understand the purpose and importance of keeping records on the farm
- Understand and apply some basic farm records

# Records

In this session you will learn about records. Most of the farm management tools learned in module 4 depend on reliable and accurate data and information.

Farmers who keep good records of farm activities will be in a much better position to make farm management tools work for them.

# Keeping farm records

As learned in Module 3, information is an essential part of farm management.

In order for farmers to be able to use any of the farm management tools they will need information about their farm. They will want to examine their farm's performance over a number of years.

Without some means of recording data and information, farmers will find it difficult to analyse their farm and to plan for improvements.

## *What is record-keeping and what are farm records?*

Record keeping is a process by which data is systematically collected, organized and stored.

Farm records are the means of storing data and information so that it can be recalled and used at some later date.

Each of these types of records helps the farmer remember what has happened on the farm and within the business.

Farm records may also include off-farm information about things like market prices, input prices, and market demands



## *Why keep records? The value of keeping records*

The farmer can use the data and information from farm records to:

Measure the production performance of the farm

Measure the financial performance of the farm

Examine the farm business

Plan the farm business

## *Why keep records? The value of keeping records*

Without good records, a farmer must rely on memory for making decisions.

Having a workable system for recording and retrieving data and information will make it much easier to improve the profitability of the farm.

The farmer will need to record, keep and be able to retrieve data about production, marketing, processing, household consumption and expenses.

## *Why keep records? The value of keeping records*

Farm records also provide useful information for you to help farmers increase farm profits, adjust farm practices, select enterprises, determine the best use of available resources, obtain credit and formulate production plans.

Many extension workers only keep approximate figures for the area they are working, but it is much better if each farmer has accurate farm records of what has happened.

# *Why keep records? The value of keeping records*

Records are important management tools that enable you and farmers to:

Provide them with a history of what has happened on the farm between seasons and years

Asses the physical and financial performance of an enterprise or the whole farm business

Assess how a farm is progressing over a given period

Establish a basis for budgeting and planning changes in the farm business

# *Why keep records? The value of keeping records*

Tell farmers how much they are earning

Facilitate advisory services to farmers wishing to borrow money for investment, sales and marketing of produce

It allows the farmer to adhere to legal responsibilities on the farm

Apart from its potential use in farm management decision-making, farm records are sometimes used to formulate national policies, programme and action plans

## *Why farmers do not keep records*

In many cases in Africa record keeping is not well developed among farmers.

This is in part due to the low levels of education, literacy and numeracy.

Very few farmers keep records and know how to use the information collected.

# *Why farmers do not keep records*

Reasons	Suggested solutions
Cannot read and write	Use pictorial illustrations Get help from children/literate neighbours
Forgetting to record	Making frequent contacts to remind them to record
Discouraged by low yields	Encouraging farmer and rural entrepreneur to farmer and rural entrepreneur learning
Procrastinating recordings	Encouraging them by examples from like farms
Tiredness after the day's work	Advise to carry record book along and make use of children
No safe place to keep record books	Create a simple, secure place Explain importance of record books to children and other family members
Don't have record book to record in	Help develop simple records Ask government, NGO, coop, etc. to assist farmer and rural entrepreneurs with record books.
Farmer and rural entrepreneur's spouse or children market without recording	Demonstrate to them the importance of recording sales
Lack of reasons why records need to be kept	Take time to explain reasons to farmer and rural entrepreneurs
Laziness and lack of encouragement by neighbouring farmer and rural entrepreneurs	Encouragements and invitation to group discussions and meetings.
Not recording home consumption, gifts, donations and ceremonial usage	Extending the importance of recording home consumption and gifts

## *Types of records*

Record-keeping can be kept simple and need not take up much of the farmer's time.

There are many simple methods that have been devised for farmers to keep records even though they may not be literate.

It does require self-discipline and commitment to fill them in regularly.



## *Types of records*

Various types of farm records can be introduced for literate, semi-literate and illiterate farmers.

Farm records require self-discipline and commitment to fill them in regularly.

So farmers have to be motivated by a desire to improve their level of income.

## *Physical records*

These serve the daily needs of farmers in managing their operations and are designed to control specific activities.

The records cover the main farm enterprises: crop, livestock, fisheries and household based food processing.

## *Physical records*

Records are used to produce specific kinds of information.

Production records could be divided according to the main input;

Crop inputs

Livestock inputs

Fisheries inputs

Processing inputs

## *Physical records*

Physical records show the quantities of the inputs used and outputs obtained.

They also indicate the timing and methods of operation.

# *Physical records*

The farm map

Production records

Labour records

Machinery and equipment records

Livestock/poultry records

Marketing records

## *Financial records*

Financial records are used to evaluate the financial performance of an individual enterprise or of the whole farm.

Financial records help the farmer to know how well individual enterprises perform and contribute to overall farm profit at the end of the season or production cycle.

Financial records include the main cash transactions on the farm: sales, purchases and money borrowed as expressed in the cash flow and gross margin calculations.

## *Financial records*

Financial records are kept in the form of accounts of what the farmer spends and receives.

Purchases and expenses can be recorded on one page.

Sales and receipts can be recorded on another.

# *Simple account book*

**Purchases and expenses**

Date	Detail	\$

**Sales and receipts**

Date	Detail	\$



## *Home consumption, income and expenditure*

Records can also be kept of home consumption, of other non-farm sources of income, and of expenditure.

If the farmer uses a large part of the production to feed the family it should also be recorded.

This part of production does not appear as sales in the account book, but it has value.

## *Home consumption, income and expenditure*

The value of the crop includes not only what is sold, but also what is consumed by the farmer and his family.

Keeping a record of farm products consumed acknowledges the value of that production.

It also ensures the farmer has an accurate record of production from the farm. This will help determine the true profitability of the farm.

## *Example; Information recording*

Date	Detail	\$	Comments
Jan-01	6 eggs	2.50	
Jan-15	2 kg Spinach	1.00	

## *Home consumption, income and expenditure*

At the end of the year the farmer adds up the total value of home consumption.

The value is added to the farmer's total receipts to give the value of total production of the farm.

The value of sales plus the value of home consumption, less total expenses provides an assessment of farm profit.

## *Home consumption, income and expenditure*

Another record could cover household non-farm income sources and expenditures.

This will help the farmer to understand the role of the household cash flow on the farm.

# *Example record of household non-farm income sources and expenditures.*

Income sources		
Date	Item of Income	Amount \$










Expenditure		
Date	Item of Expenditure	Amount \$

## *Records for non-literate farmers*

It is possible to help farmers keep records without having to be literate or numerate.

For example columns can be allocated to the local denominations of money and amounts taken or spent on certain items can be recorded by making a mark in the relevant column.

# Records for non-literate farmers

	$\oplus$	\$		$\ominus$	\$
1-7-06	<span style="border: 1px solid black; padding: 2px;">100</span>	800	1-7-06	 $2 \times 200$	400
1-7-06		100	1-7-06	 $1 \times 250$	250
1-7-06		60	1-7-06	 $1 \times 120$	120
1-7-06		40	1-7-06		60
<span style="border: 1px solid black; padding: 5px; display: inline-block;">1000</span>			<span style="border: 1px solid black; padding: 5px; display: inline-block;">830</span>		
			<span style="border: 1px solid black; padding: 5px; display: inline-block;"><span style="border: 1px solid black; padding: 2px;">100</span> <math>1000 - 830</math> <span style="border: 1px solid black; padding: 5px; display: inline-block;">170</span></span>		



# *Principles of record keeping*

Accurate and complete and filled in as soon as possible after the operation

Neat and written clearly

Complete by not leaving out any information

Be simple in design, easy to keep and retrieve

Easy to analyze

Appropriate

## *Principles of record keeping*

Care should be made that only the really vital information required by the farmer is collected through record keeping.

The whole purpose of record keeping is to improve the standard of farm management.

## *Principles of record keeping*

There is no value in spending time on records and calculations of profit and production in individual enterprises, if no use is made of them.

All of the results should be compared with some standards as discussed.

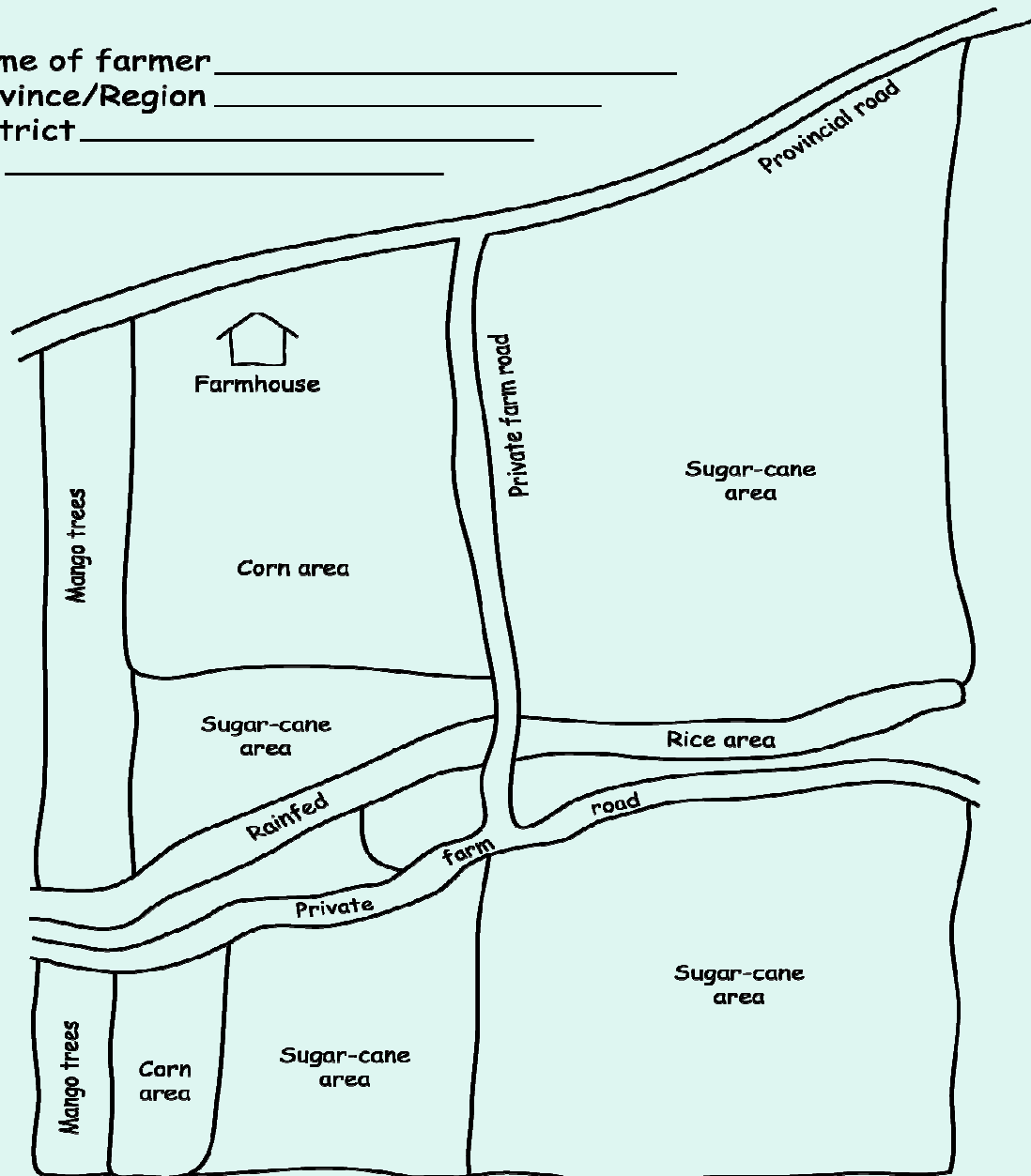
## Examples of forms for record keeping

Name of farmer \_\_\_\_\_

Province/Region \_\_\_\_\_

District \_\_\_\_\_

Lot \_\_\_\_\_



## Module 4 :Review

- Do you believe that the overall purpose of the module has been achieved ?
- You should have a good understanding and basic skills to apply a set of farm management tools:
- Constraints and opportunities analysis, Gross margin budgeting, Marketing margins, Break-even budgets, Sensitivity analysis, Planning for food requirements, Labour planning, Cash flow, Records.