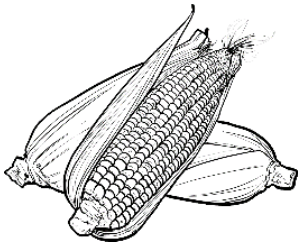
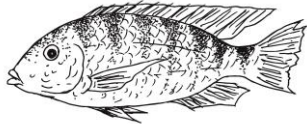


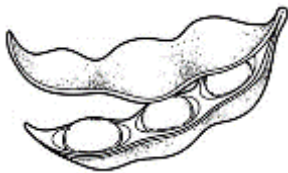


giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Aquaculture Business School



Training Notebook and Workbook Malawi



Tilapia, Maize, Soy bean

2nd Edition

September 2022



Foreword

The Farmer Business School (FBS) approach was developed in 2010 by GIZ/Sustainable Cocoa Business and local partners from Ghana, Nigeria, Côte d'Ivoire, Cameroon and Togo, for cocoa production systems. This and implementation for over 480,000 smallholders was achieved with the support of the Federal Ministry of Economic Cooperation and Development of Germany (BMZ), the World Cocoa Foundation, Bill & Melinda Gates Foundation, NIRSAL from Central Bank of Nigeria and the European Union. Since 2012, other GIZ programmes as well as public and private partners have adapted the FBS, with a total outreach presently exceeding 1.5 million smallholder farmers in 20 countries.

The concept has been adapted specifically for aquacultural entrepreneurs. Aquaculture Business School (ABS) is building on experiences with FBS taking into consideration specific content elements for the aquaculture value chain. GIZ Aquaculture Value Chain for Higher Income and Food Security in Malawi (AVCP) is implementing the ABS in Malawi, in collaboration with the Ministry of Forestry and Natural Resources, the Department of Fisheries, and other stakeholders. Introducing ABS in Malawi shall contribute to achieve the following specific objectives:

- Professionalizing aquaculture entrepreneurs for stronger business linkages with input suppliers and off-takers
- Productivity and quality increases of aquaculture as a business;
- Improved incomes and living conditions of aquacultural entrepreneurs and their families

The Agribusiness Facility for Africa (ABF) project of GIZ has supported the adaptation of Aquaculture Business School (ABS).


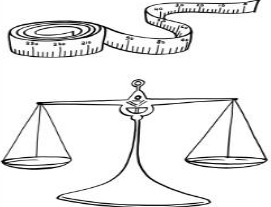
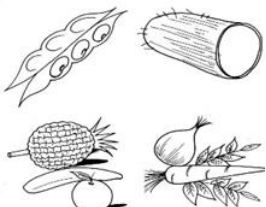



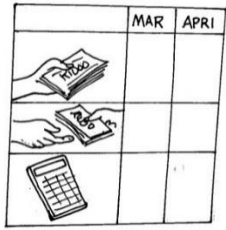

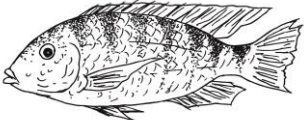

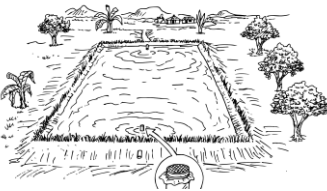

Only ABS-Trainers that underwent a special qualification program including classroom and learning trainings with farmers deliver the training in line with the principles of adult and discovery learning and the quality standards of ABS.

At the end of the training ask for your ABS participation certificate with serial number and signature

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1. Aquaculture Business School: the training

Introduction: What is Aquaculture Business School (ABS) about?

				
<p>M1 Is farming a business?</p>	<p>M2 Know the units to know your assets</p>	<p>M3 Manage your farm for enough food for better nutrition</p>	<p>M4 Money-In / Money-Out: Know whether you are doing good business</p>	<p>M5 Make decisions for doing good business</p>
				
<p>M6 Diversify your farm enterprise for more income and nutrition</p>	<p>M7 Manage your money throughout the year</p>	<p>M8 Know how to get good financial services</p>	<p>M9 Make more money with improved feeding techniques and management</p>	<p>M10 Know the benefits of membership of Farmers' Organisations</p>
		<p>What are the advantages?</p> <p>The skills learned in Aquaculture Business School will allow you to become a better entrepreneur who:</p> <ul style="list-style-type: none"> - Takes advantage of improved technologies and market opportunities to increase income - Plans and adapts his production to assure food security for the family - Targets decisions and investments in production - Leads professional negotiations with buyers, input suppliers, credit institutions and land owners. - Manages financial means and credit. 		
<p>M11 Long-term investment in pond-based aquaculture</p>	<p>M12 Become an aquacultural entrepreneur</p>			

Module 1 Is fish farming a business?

What examples of businesses do you know?

Examples of businesses	Start and end of activities	Money-Out	Money-In
Construction 	<ul style="list-style-type: none"> • One can start when one has a contract with a client. • One must respect the conditions of the client. • One construction site follows the next. 	For the machines, tools, materials and wages	When the construction is completed
Trading 	One can start and stop buying and selling at any time.	To buy stock / merchandise and to pay employees	All year long
Processing of agricultural products Maize bran, processed soy 	<ul style="list-style-type: none"> • One can start the processing at any time, if one has the equipment and primary materials/inputs. • One stops the processing when the primary material is no longer available. (Some products are seasonal.) 	To buy raw material and equipment, and to hire employees	All year long if you have raw material
Agriculture 	<ul style="list-style-type: none"> • One needs to start the agricultural work at the beginning of the season • One cannot stop the field work before the harvest (or the use of the seedlings) 	For tools, equipment, inputs, services (tractor) and hired labour force	After harvest, when products are ready, at the moment of sales
Aquaculture (pond-based) 	<ul style="list-style-type: none"> • One can start pond-based aquaculture anytime with seasonal limitations, if one has land for pond construction, feed (natural or artificial), fingerlings and time to manage the pond. • One cannot stop the fish production before harvest 	For pond construction, feed, fingerlings, fertilizer, equipment, services (tractor) and hired labour force	After harvest, when products are ready, at the moment of sales

What does the aquacultural entrepreneur need and use to produce products?

Inputs	Tools and equipment	Labour	Money	Land
Water, manure, fertiliser, fingerlings, feed labour, equipment	Pond, net, weighing scale, pipe, pump, hapa, thermometer	Family work force, hired workers	Own money, credit	Own land, leased/rented land

Main Lessons

Farming and aquaculture are businesses like any other business. They are productive activity aimed at making a profit (getting more out than you put in).

The agricultural entrepreneur needs business management skills to be successful and to understand if he/she is successful.

The agricultural entrepreneur (man or woman) plans and organizes him/herself to have inputs, tools, labour and money necessary for the production ready at the right time.

What does one need to know about the market to do good business?

The market for agricultural produce	The market for inputs and equipment
<ul style="list-style-type: none"> • The location of the market • Access to the market • Who needs the product and wants to buy it • When the product is needed • The qualities of product that is demanded by the market • The price of the product compared to other markets and how it changes 	<ul style="list-style-type: none"> • The location of suppliers • Who sells the inputs and equipment • The recommended quality of inputs and equipment • The prices for inputs, tools and equipment and their seasonal variations • Year round availability of inputs (especially feed and fingerlings)

How does the price of agriculture products change?

<p>The prices of agriculture products change according to the season of the year</p> <ul style="list-style-type: none"> • At times of abundance, the prices are lowest. • Prices are highest at times of scarcity for example during the dry season or during closed fishing seasons. 	<p>The prices of agricultural products change between years.</p> <ul style="list-style-type: none"> • The price of a product that is needed by more and more people will rise from one year to the next. • The price of a product that is produced in greater abundance will fall from one year to the next.
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Critical aspects of **aquaculture products** influencing **price**:

- Species
- Size
- Freshness (morning vs. evening)
- Processing form (smoked, dried)

Main Lesson











To do successful business, the agricultural entrepreneur (man or woman) informs him/herself on the prices of inputs and products at different markets..

This allows the farmer to plan production, and to make decisions on the purchase of inputs and the sale of produce.

Agricultural calendar to plan your crop production

Work planning for soybean.

Mark with an "X" to show the month in which you do the task:











 The tasks of the entrepreneur	September	October	November	December	January	February	March	April	May	June	July	August
 Planning Record keeping												
 Early and proper land preparation (CA, crop rotation)												
 Early planting Fertilizer/ manure application												
 Correct plant population (thinning and gap filling)												
 Timely and regular weeding												
 Scouting for pests Pesticide application Safe use and storage of pesticides												
 Harvest												
 Post-harvest operations – Quality! Proper drying, shelling, winnowing, grading, bagging, storage, etc.												
 Marketing												

Main Lesson A good agricultural entrepreneur (man/woman) plans to do the necessary work in the field for a good yield, considering which crop to plant and/or harvest first, and uses inputs efficiently for better profit

Aquaculture calendar to plan your fish production

Work plan for fish production in pond

Mark with an "X" to show the month in which you do the task:

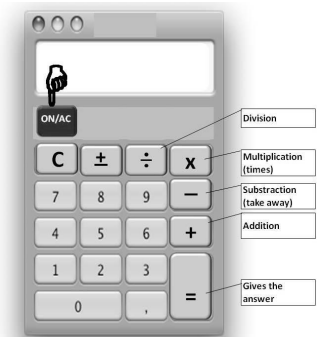
Tasks of the entrepreneur 		January	February	March	April	May	June	July	August	September	October	November	December
	Pond sight selection												
	Pond preparation												
	Purchase of inputs (fish feed)												
	Slushing of dikes												
	Applying organic fertiliser												
	Stocking of fish												
	Feeding												
	Checking, weighing and observing												
	Harvesting												
	Transport												
	Marketing & sales												

Main Lesson: A good aquacultural entrepreneur (man or woman) plans for doing all production work, considering the type of fish species and how to use the inputs efficiently for better profit.

Module 2 Know the units to know your assets

Before we start measuring an area, let's get familiar with the calculator.

How to use a calculator

<p>WHAT IS A CALCULATOR?</p> <p>A calculator is a tool that you can use to do addition, subtraction, multiplication and division</p> <p>To switch on the calculator: Press ON/AC</p> <p>To clear a wrong number: Press C</p> <p>To start a new calculation: Press ON/AC to clear</p>	
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Addition (Plus)

Example: $5 + 9 = 14$ Type 


Example: $10 + 20 = 30$ Type 

Subtraction (Minus or Take Away)

Example: $9 - 4 = 5$ Type 

Example: $100 - 20 = 80$ Type 

If you subtract a higher number from a lower number, the calculator will give you a minus number as in this example. You will know this by the small dash "-" in front of the answer.

Example: $20 - 29 = -9$ Type 

Example:

$$-20 - 29 = -49$$

Type



A digital calculator interface showing the calculation of -20 minus 29. The top row features seven hand icons pointing down. The keypad below contains buttons for '+', '2', '0', '-', '2', '9', and '=', each with a hand icon above it. The result '-49' is displayed in a rounded rectangular box on the right.

Multiplication (Times)

Example:

$$25 \times 12 = 300$$

Type



A digital calculator interface showing the calculation of 25 times 12. The top row features six hand icons pointing down. The keypad below contains buttons for '2', '5', 'x', '1', '2', and '=', each with a hand icon above it. The result '300' is displayed in a rounded rectangular box on the right.

Example:

$$22 \times 27 = 594$$

Type



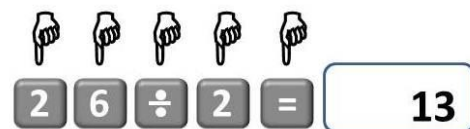
A digital calculator interface showing the calculation of 22 times 27. The top row features six hand icons pointing down. The keypad below contains buttons for '2', '2', 'x', '2', '7', and '=', each with a hand icon above it. The result '594' is displayed in a rounded rectangular box on the right.

Division (Divide)

Example:

$$26 \div 2 = 13$$

Type

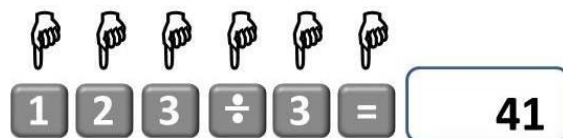


A digital calculator interface showing the calculation of 26 divided by 2. The top row features five hand icons pointing down. The keypad below contains buttons for '2', '6', '÷', '2', and '=', each with a hand icon above it. The result '13' is displayed in a rounded rectangular box on the right.

Example:

$$123 \div 3 = 41$$

Type



A digital calculator interface showing the calculation of 123 divided by 3. The top row features six hand icons pointing down. The keypad below contains buttons for '1', '2', '3', '÷', '3', and '=', each with a hand icon above it. The result '41' is displayed in a rounded rectangular box on the right.

Here are some more examples. Try to get the same result.

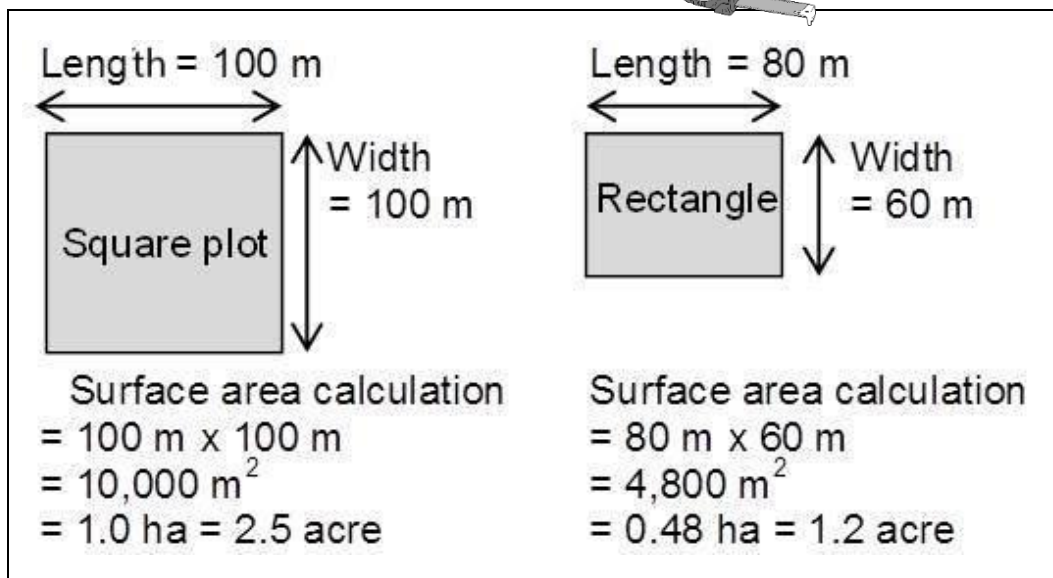
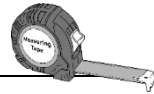
Addition (plus)	Subtraction (minus / take away)
$100 + 250 = 350$ $124 + 24 + 52 = 200$ $1035 + 465 + 120 = 1620$	$33 - 13 = 20$ $175 - 35 = 140$ $1243 - 12 = 1231$
Multiplication (times)	Division (divide)
$33 \times 3 = 99$ $75 \times 5 = 375$ $12 \times 12 = 144$	$200 \div 4 = 50$ $350 \div 7 = 50$ $1100 \div 8 = 137.5$

Measure and calculate the surface of a field or pond.

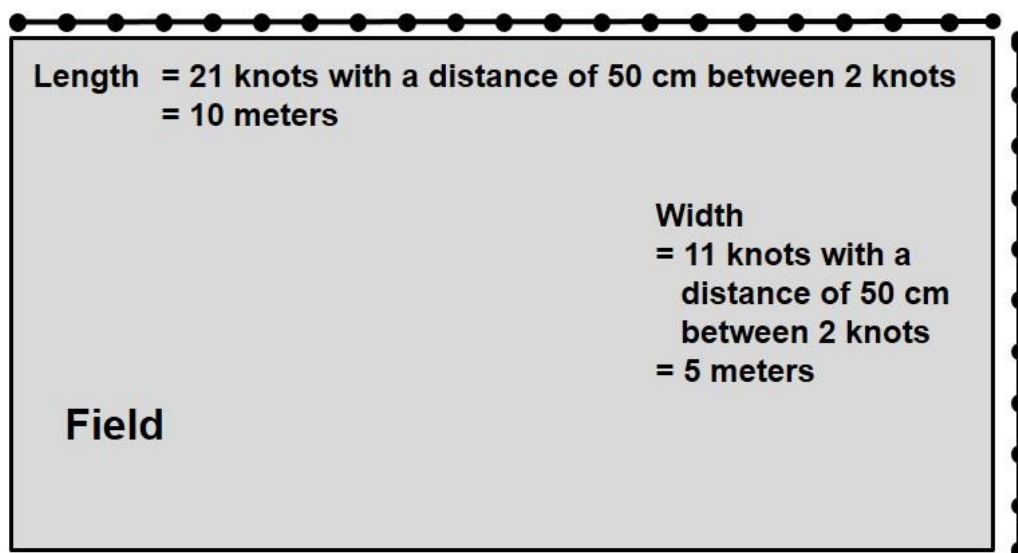
The size or surface area of a field or pond is measured in square metres (m²) or hectares (ha).

1 hectare (ha) is 10,000 meters squared (m²). 1 acre = 4,000 m².

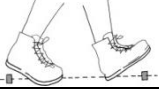
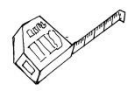
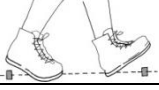
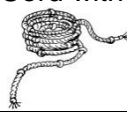
Measuring an area using a measuring tape:




Measuring area using a cord with knots



Exercise

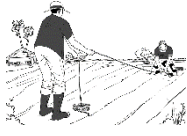
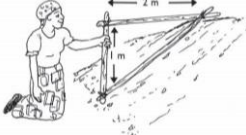
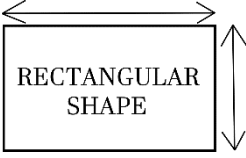

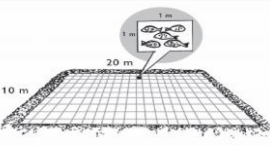





	Method	Length <input type="checkbox"/>	Width <input type="checkbox"/>	Surface size	Difference with measuring tape	Rank
Group 1	Estimation by steps 	<input type="checkbox"/>	<input type="checkbox"/>			
	Measuring tape in meters 	<input type="checkbox"/>	<input type="checkbox"/>			
Group 2	Estimation by steps 	<input type="checkbox"/>	<input type="checkbox"/>			
	Cord with knots 	<input type="checkbox"/>	<input type="checkbox"/>			

	<p>The most modern way of measuring the size of a field is by using the GPS (which stands for Global Positioning System.) If you don't have your own GPS device or smartphone with a reliable application, you can ask local extension agents to assist you.</p>
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Main Lessons

1. Measuring the field size by walking-steps is not always accurate.
2. The aquacultural entrepreneur (man or woman) who
 - underestimates field size, risks using too little fertiliser and too few seeds, which can lead to reduced yields; or
 - overestimates field size, risks using too much fertiliser and planting too close together, which can lead to reduced yields and unnecessary spending.
3. The aquacultural entrepreneur (man or woman) measures his/her fields/ponds with a measuring tape or with a cord with knots.
4. A field in the shape of a rectangle or square is easy to measure. On such a field it is easier to sow or plant in lines, respecting the correct spacing distances.
5. GPS measurement is another (more modern) technique for measuring farm size and fields of irregular shape. Ask your extension agent to assist you.
6. A field in the shape of a rectangle or square is easy to measure. On such a field, it is easier to sow or plant in lines respecting the correct spacing distances

Standard measures and units

Distance	Kilometre (km): 1 km = 1,000 metres (m)
Length width or depth of a field  Slope of a dike 	Meter (m): 1 m = 100 centimetres (cm) Increase in height by 1 m over a distance of 2 meter = 50 % or 27°
Surface area 	Hectares (ha) Square meter (m ²) 1 ha = 10,000 m ² 1 acre = 4,000 m ² (e.g. 50 m x 80 m or 40 m x 100 m) 1 hectare = 2.5 acres / 1 acre = 0.4 hectares
Weight 	Gram (g) Kilogram (kg): 1 kg = 1,000 g Ton (T): 1 ton = 1,000 kg
Density 	Stock per square meter – eg. Number of fingerlings in the pond per square meter
Yield per unit area 	Yield per hectare: Yield per acre Example: 2,000 kg maize/ha = 800 kg maize/acre
Volume 	Litre (l) Millilitre (ml) 1 l = 1,000 ml
Temperature 	Celsius degree - e.g. 25°C –ideal temperature for tilapia
Time 	Minutes (min) Hour (h): 1 hour has 60 minutes Day (D): 1 day has 24 hours
Agricultural work 	Man-days (MD): The work of an adult man in one day. Example: Work on one hectare requires 10 Man-days. (10 MD / ha). The work can be done by 1 man in 10 days or 10 men in 1 day. It is important to specify the number of hours in a work day.

Main Lessons

Units and measures are important for the agricultural entrepreneur (man or woman).

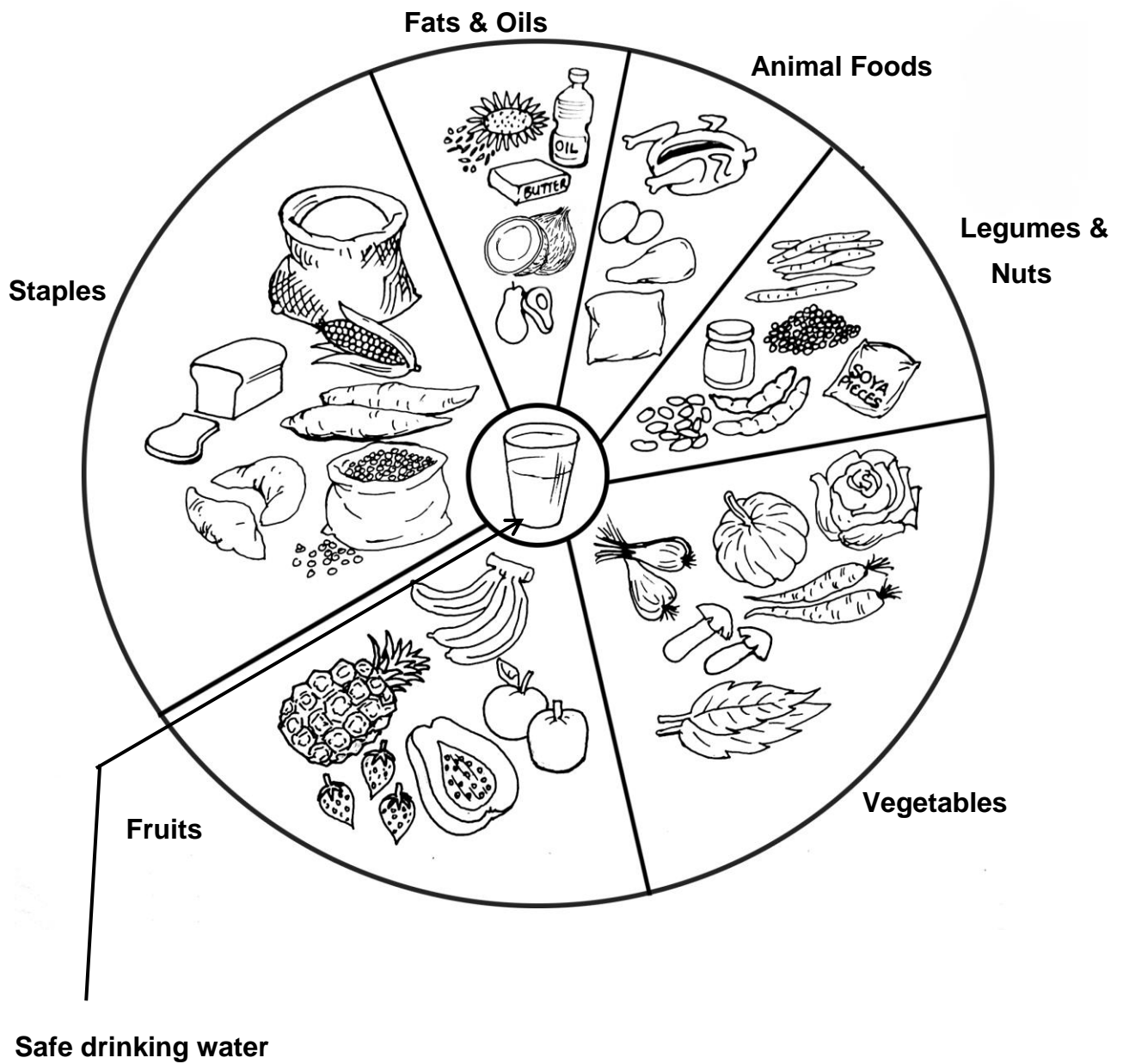
They are necessary:

- to know precisely the assets, such as the size of your land and amount of labour needed;
- to correctly plan production and the quantities of inputs that need to be available on time;
- to apply correct amounts of inputs such as seeds, manure and fertiliser;
- to know before harvest if investments will exceed expected income
- to know the quantity harvested (weighing harvest with a calibrated scale);
- to correctly evaluate losses or profits; and
- to better sell the products.

Measures and units are important for the producer to do good business.

Module 3 Manage your farm for enough food and better nutrition

Making money with agriculture is good, but the farm must also provide enough nutritious food for your family.

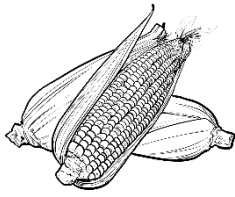




These products give us energy and physical strength to work and to grow.



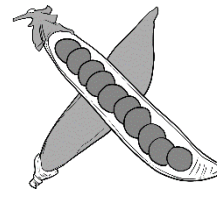
These products give us physical strength and mental force.



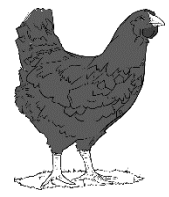
Maize



Rice



Beans & Peas



Poultry (chicken)



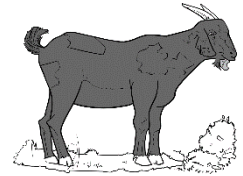
Millet



Cassava



Groundnut



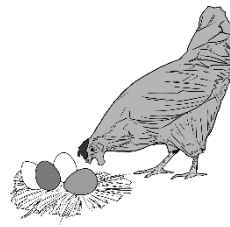
Meat (goat, cattle etc.)



Sorghum



Sweet potato



Eggs



Fish

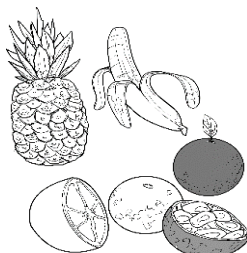


These products give us protection

Oils give us energy and make the meals tasty.



Fruits give us energy (sugar) and health.



Vegetables give us health and make the meals tasty.



Clean drinking water keeps us healthy.












Source: Adapted from Food and Agriculture Organisation (FAO), *Family Nutrition Guide*, 2004.





Main Lesson:

The agricultural entrepreneur (man or woman) knows that each type of food and clean drinking water are necessary for good and balanced nutrition for his/her family.

How much energy and protein do we need per day?

					
	Pregnant woman	Breastfeeding woman	Children 0 to 6 months	Children 7 to 11 months	Children 1 to 3 years
Energy Kcal per day	2,690	2,860	524	708	1,022
Protein Grams per day	47	60	12	14	14
			Breastfeeding	Breastfeeding plus 2 to 3 meals per day	Breastfeeding plus 3 to 4 meals per day

				
	Children 4 to 6 years	Children 7 to 9 years	Girls 10 to 17 years	Boys 10 to 17 years
Energy Kcal per day	1,350	1,700	2,330	2,830
Protein Grams per day	22	25	43	48











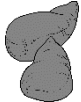

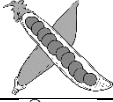















				
	Men 18 to 59 years	Women 18 to 59 years	Men 60 years and more	Women 60 years and more
Energy Kcal per day	3,100	2,410	2,500	2,140
Protein Grams per day	50	41	50	41

Source: Adapted from Food and Agriculture Organisation (FAO), *Family Nutrition Guide*, 2004.

Main lesson

The agricultural entrepreneur (man or woman) knows that the different types of food need to be combined to ensure a good nutrition of his/her family

Food products and their content in energy, protein and fat

Food	Energy (kcal per kg)	Fat (grams per kg)	Protein (grams per kg)	
Maize 	3,530	38	93	
Sorghum 	3,450	30	100	
Millet 	3,780	43	110	
Rice 	3,610	10	65	
Cassava 	1,490	2	12	
Sweet Potato 	1,050	17	3	
Beans & Peas 	3,330	8	226	
Groundnut 	5,670	450	258	
Soybeans 	4,160	200	365	
Chicken 	2,230	134	240	
Eggs 	1,580	112	120	
Fish (e.g. Tilapia) 	1,610	79	195	
Fruits (orange) 	450	2	9	
Vegetables (carrot) 	305	0	7	

Source: Adapted from FAO, *Family Nutrition Guide*, 2004; <http://www.nutritiondata.com/facts/fats-and-oils/575/2>







Explanation: The kilocalorie (kcal or 1,000 calories) is a measure for the energy of food. The number of kilocalories of 1 kg of a given food shows whether the food is rich or poor in nutrition.






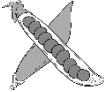
Main lessons

- The agricultural entrepreneur (man or woman) knows that each type of food is necessary for a good and balanced nutrition of his/her family.
- The agricultural entrepreneur (man or woman) knows that the different types of food ensure a healthy nutrition of his/her family.
- The agricultural entrepreneur (man or woman) knows that the members of his family have different needs of food.
- Very good food for pregnant and breastfeeding women ensures good health and growth of new children
- From the 7th month onward children need good quality meals (without spices!) and breast feeding for good health and growth.
- Children of a certain age need almost as much food as adult persons.
- The agricultural entrepreneur (man or woman) knows that the members of his/her family need clean water therefore he/she takes the necessary measures such as Integrated Pest Management including safe use of pesticides and disposal of empty containers to conserve water resources.
- The nutrition level will also depend on the preparation and storage.

Nutritional calendar: How do you cover the food needs of your family?

- Mark with a square (□) if the product is sold.
- Mark with a triangle (△) to show the months in which you need to buy the product.
- Mark with a circle (○) if the product is eaten.
- Indicate with a line (–) how long the product is available from own production.
- What are the months of high prices and the months of low prices for a food item?

	Sell □	Eat ○	September	October	November	December	January	February	March	April	May	June	July	August
 Maize / maize flour														
 Groundnuts														
 Soybeans														
 Fresh cassava														
 Rice														
 Sorghum / sorghum flour														

	Sell □	Eat ○	September	October	November	December	January	February	March	April	May	June	July	August
 Chickens (poultry)														
 Meat														
 Fish														
 Fruits														
 Vegetables														
 Beans & Peas														

How to have more and better food

<p>Plan the season</p> 	<p>Use improved varieties for improved yields</p> 	<p>Integrated soil fertility management</p> 
<p>Associate crops</p> 	<p>Mulching to conserve soil moisture</p> 	<p>Diversify cropping</p> 
<p>Proper pest and disease management</p>  <p>Scouting, pesticide applications</p>	<p>Use proper facilities to reduce losses in storage</p> 	<p>Improve financial management</p> 
<p>Establishing well-managed fish ponds</p> 	<p>Prepare food well</p> 	<p>Other possibilities</p> <ul style="list-style-type: none"> - Produce early maturing and drought tolerant crops; - Use water harvesting techniques to conserve water and for small-scale irrigation - Establishing backyard gardens - Raising animals (chickens, goats, etc.)


Module 4 Money-In / Money-Out: Know whether you are doing good business

Two farmers are discussing whether they did good or bad business last season.

- One farmer doesn't know. Why?
- The other knows. Why? And what is the use of knowing?

In this module we will learn how to calculate and determine whether our current way of farming is a good or bad way of doing farming business. We will calculate the "money in" and "money out" from different produce.

In this exercise we will use the calculator again

<p>To put on the calculator Press the ON/AC</p> <p>To clear a wrong number Press C – CE</p> <p>To start a new calculation Press the ON/AC to clear</p>	 <p>Division</p> <p>Multiplication (times)</p> <p>Subtraction (take away)</p> <p>Addition</p> <p>Gives the answer</p>
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Module 4 – Exercise Sheet 1: Tilapia (current practices)

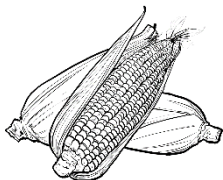


Steps:

- Multiply the quantity with the price in each line for inputs/services.
- Add up the money spent (Money-Out) on inputs, services, and labour.
- Multiply the yield by the sales price (Money-In).
- Subtract the total of Money-Out from the Money-In.
- Determine whether you made a profit or a loss.












One 200 sqm pond -stock density 2 fish/sqm, mortality rate 30% 1 cycle per year – expected yield 35kg	Unit	Quantity	Price (MWK)	Total (MWK)
1. Money-Out – Inputs and Services				
Fingerlings	Each	400 <input type="text" value="x"/>	35 <input type="text" value="="/>	
Organic fertiliser	100kg bag	2 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
Maize bran	20 kg bag	6 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
Transport of feed & fingerlings	lumpsum	2 <input type="text" value="x"/>	3,000 <input type="text" value="="/>	
Packing of fingerlings	lumpsum	1 <input type="text" value="x"/>	150 <input type="text" value="="/>	
Transport to Market	Lumpsum	1 <input type="text" value="x"/>	1500 <input type="text" value="="/>	
Total Cost of Inputs and Services			MWK	
2. Money-Out – Labour				
Pond preparation	MD	3 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Slushing of dikes	MD	4 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Fertilising	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
stocking of fingerlings	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Feeding	MD	6 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Checking & Weighing & Observing	MD	0 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Harvesting	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Marketing & sales	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Total Labour Needs (Man-days)	MD			
3. Total Money-Out			MWK	
4. Money-In				
Production <input type="text" value="x"/> Sales price	Kg	35 <input type="text" value="x"/>	2,500 <input type="text" value="="/>	
5. Profit or Loss? (Money in MINUS Money-Out = Gross Margin)			MWK	
6. Unit Cost (Total Money-Out / Production)			MWK/Kg	

Module 4 – Exercise Sheet 2: Maize (current practices)



Steps:

- Multiply the quantity with the price in each line for inputs/services.
- Add up the money spent (Money-Out) on inputs, services, and labour.
- Multiply the yield by the sales price (Money-In).
- Subtract the total of Money-Out from the Money-In.
- Determine whether you made a profit or a loss.

1 hectare of maize: 1,300kg yield		Unit	Quantity	Price (MWK)	Total (MWK)
1. Money-Out – Inputs and Services					
Seed from own production 		kg	25 <input type="text" value="x"/>	1,800 <input type="text" value="="/>	
Herbicide pre-emergence		litre	<input type="text" value="x"/>	<input type="text" value="="/>	
Herbicide post-emergence		litre	<input type="text" value="x"/>	<input type="text" value="="/>	
Fertiliser	Basal NPK 	50 kg	2 <input type="text" value="x"/>	22,000 <input type="text" value="="/>	
	Top-dressing urea		2 <input type="text" value="x"/>	19,500 <input type="text" value="="/>	
Pesticides	e.g. stalkborer	200ml	<input type="text" value="x"/>	<input type="text" value="="/>	
	Actelic super	50g	4 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
Empty bags 		50 kg bag	26 <input type="text" value="x"/>	150 <input type="text" value="="/>	
Transport	Field to house 	load	4 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
	To market 	Fee/bag	26 <input type="text" value="x"/>	700 <input type="text" value="="/>	
Total Cost of Inputs and Services				MWK	
2. Money-Out – Labour					
Land preparation 		MD	15 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Planting (broadcast) 		MD	5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Herbicide application		MD	<input type="text" value="x"/>	<input type="text" value="="/>	
Fertiliser application 		MD	8 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Gap filling 		MD	<input type="text" value="x"/>	<input type="text" value="="/>	
Weeding		MD	16 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Harvesting and stocking 		MD	5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Post-harvest handling (shelling, winnowing, bagging)		MD	15 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Pesticide application, storage		MD	1 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Marketing 		MD	1 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Total labour needs (Man-days)		MD		MWK	
3. Total Money-Out				MWK	
4. Money-In					
Production grain <input type="text" value="x"/> Selling price		kg	1,300 <input type="text" value="x"/>	150 <input type="text" value="="/>	
5. Profit or Loss? (Money-in MINUS Money-Out = Gross Margin)				MWK	
6. Unit Cost (Total Money-Out / Production)				MWK/kg	

Module 4 – Exercise Sheet 3: Soybean



Steps:

- Multiply the quantity with the price in each line for inputs/services.
- Add up the money spent (Money-Out) on inputs, services, and labour.
- Multiply the yield by the sales price (Money-In).
- Subtract the total of Money-Out from the Money-In.
- Determine whether you made a profit or a loss.

1 ha soybean – 800 kg yield	Unit	Quantity	Price (MWK)	Total (MWK)
1. Money-Out – Inputs and Services				
Seeds	kg	40 <input type="text" value="x"/>	260 <input type="text" value="="/>	
Innoculum	50gram	<input type="text" value="x"/>	<input type="text" value="="/>	
Herbicide - post-emergence	litre	<input type="text" value="x"/>	<input type="text" value="="/>	
Fertiliser Basal NPK	50 kg bag	<input type="text" value="x"/>	<input type="text" value="="/>	
Empty bags	50 kg bag	16 <input type="text" value="x"/>	150 <input type="text" value="="/>	
Mechanical shelling	Fee/ bag	<input type="text" value="x"/>	<input type="text" value="="/>	
Transport field to home	Load/cart	2 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
Transport to market	Fee/ bag	16 <input type="text" value="x"/>	700 <input type="text" value="="/>	
Total Cost of Inputs and Services			MWK	
2. Money-Out – Labour				
Land preparation	MD	15 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Planting	MD	5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Herbicide application	MD	<input type="text" value="x"/>	<input type="text" value="="/>	
Fertiliser application	MD	<input type="text" value="x"/>	<input type="text" value="="/>	
Gap filling	MD	<input type="text" value="x"/>	<input type="text" value="="/>	
Weeding	MD	16 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Banking	MD	10 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Harvesting	MD	15 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Post-harvest handling (plucking, proper drying, bagging)	MD	8 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Marketing	MD	1 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Total Labour Needs (work-days)			MWK	
3. Total Money-Out			MWK	
4. Money-In				
Production <input type="text" value="x"/> Selling price	kg	800 <input type="text" value="x"/>	500 <input type="text" value="="/>	
5. Profit or Loss? (Money-In MINUS Money-Out = Gross Margin)			MWK	
6. Unit Cost (Total Money-Out / Production)			MWK /Kg	










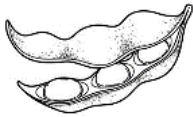
Module 4 – Solution to Exercise 1: Tilapia (current practice)

One 200 sqm pond -stock density 2 fish/sqm, mortality rate 30% 1 cycle per year – expected yield 35kg	Unit	Quantity	Price (MWK)	Total (MWK)
1. Money-Out – Inputs and Services				
Fingerlings	Each	400 <input type="checkbox"/>	35 <input type="checkbox"/>	14,000
Organic fertiliser	100kg bag	2 <input type="checkbox"/>	2,000 <input type="checkbox"/>	4,000
Maize bran	20 kg bag	6 <input type="checkbox"/>	2,000 <input type="checkbox"/>	12,000
Transport of feed & fingerlings	lumpsum	2 <input type="checkbox"/>	3,000 <input type="checkbox"/>	6,000
Packing of fingerlings	lumpsum	1 <input type="checkbox"/>	150 <input type="checkbox"/>	150
Transport to Market	Lumpsum	1 <input type="checkbox"/>	1500 <input type="checkbox"/>	1,500
Total Cost of Inputs and Services			MWK	37,650
2. Money-Out – Labour				
Pond preparation	MD	3 <input type="checkbox"/>	1,500 <input type="checkbox"/>	4,500
Slushing of dikes	MD	4 <input type="checkbox"/>	1,500 <input type="checkbox"/>	6,000
Fertilising	MD	0.5 <input type="checkbox"/>	1,500 <input type="checkbox"/>	750
stocking of fingerlings	MD	0.5 <input type="checkbox"/>	1,500 <input type="checkbox"/>	750
Feeding	MD	6 <input type="checkbox"/>	1,500 <input type="checkbox"/>	9,000
Checking & Weighing & Observing	MD	<input type="checkbox"/>	<input type="checkbox"/>	
Harvesting	MD	0.5 <input type="checkbox"/>	1,500 <input type="checkbox"/>	750
Marketing & sales	MD	0.5 <input type="checkbox"/>	1,500 <input type="checkbox"/>	750
Total Labour Needs (Man-days)	MD	15		22,500
3. Total Money-Out			MWK	60,150
4. Money-In				
Production <input type="checkbox"/> Sales price	Kg	35 <input type="checkbox"/>	2,500 <input type="checkbox"/>	87,500
5. Profit or Loss? (Money in MINUS Money-Out = Gross Margin)			MWK	27,350
6. Unit Cost (Total Money-Out / Production)			MWK/Kg	1,718.57



Module 4 – Solution to Exercise 2: Maize (current practices)

1 hectare of maize: 1,300kg yield		Unit	Quantity	Price (MWK)	Total (MWK)
1. Money-Out – Inputs and Services					
Seed from other sources 		kg	25 <input checked="" type="checkbox"/>	1,800 <input type="checkbox"/>	45,000
Herbicide pre-emergence		litre	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Herbicide post-emergence		litre	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Fertiliser	Basal NPK 	50 kg	2 <input checked="" type="checkbox"/>	22,000 <input type="checkbox"/>	44,000
	Top-dressing urea		2 <input checked="" type="checkbox"/>	19,500 <input type="checkbox"/>	39,000
Pesticides	e.g. stalkborer	200ml	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Actelic super	50g	4 <input checked="" type="checkbox"/>	2,000 <input type="checkbox"/>	8,000
Empty bags 		50 kg bag	26 <input checked="" type="checkbox"/>	150 <input type="checkbox"/>	3,900
Transport	Field to house 	load	4 <input checked="" type="checkbox"/>	2,000 <input type="checkbox"/>	8,000
	To market 	Fee/bag	26 <input checked="" type="checkbox"/>	700 <input type="checkbox"/>	18,200
Total Cost of Inputs and Services				MWK	166,100
2. Money-Out – Labour					
Land preparation 		MD	15 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	22,500
Planting (broadcast) 		MD	5 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	7,500
Herbicide application		MD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Fertiliser application 		MD	8 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	12,000
Gap filling 		MD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Weeding 		MD	16 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	24,000
Harvesting and stocking 		MD	5 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	7,500
Post-harvest handling (de-husking, winnowing, bagging)		MD	15 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	22,500
Pesticide application, storage		MD	1 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	1,500
Marketing 		MD	1 <input checked="" type="checkbox"/>	1,500 <input type="checkbox"/>	1,500
Total labour needs (Man-days)		MD	66	MWK	99,000
3. Total Money-Out				MWK	265,100
4. Money-In					
Production grain <input checked="" type="checkbox"/> Selling price		kg	1,300 <input checked="" type="checkbox"/>	150 <input type="checkbox"/>	195,000
5. Profit or Loss? (Money-in MINUS Money-Out = Gross Margin)				MWK	-70,100
6. Unit Cost (Total Money-Out / Production)				MWK/kg	204



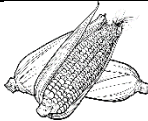


Module 4 – Solution to Exercise 3: Soybean (current practices)

1 ha soybean – 800 kg yield	Unit	Quantity	Price (MWK)	Total (MWK)
1. Money-Out – Inputs and Services				
Seeds	kg	40 <input checked="" type="checkbox"/>	260 =	10,400
Innoculum	50gram	<input checked="" type="checkbox"/>	=	
Herbicide - post-emergence	litre	<input checked="" type="checkbox"/>	=	
Fertiliser Basal NPK	50 kg bag	<input checked="" type="checkbox"/>	=	
Empty bags	50 kg bag	16 <input checked="" type="checkbox"/>	150 =	2,400
Mechanical shelling	Fee/ bag	<input checked="" type="checkbox"/>	=	
Transport field to home	Load/cart	2 <input checked="" type="checkbox"/>	2,000 =	4,000
Transport to market	Fee/ bag	16 <input checked="" type="checkbox"/>	700 =	11,200
Total Cost of Inputs and Services			MWK	28,000
2. Money-Out – Labour				
Land preparation	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500
Planting	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500
Herbicide application	MD	<input checked="" type="checkbox"/>	=	
Fertiliser application	MD	<input checked="" type="checkbox"/>	=	
Gap filling	MD	<input checked="" type="checkbox"/>	=	
Weeding	MD	16 <input checked="" type="checkbox"/>	1,500 =	24,000
Banking	MD	10 <input checked="" type="checkbox"/>	1,500 =	15,000
Harvesting	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500
Post-harvest handling (plucking, proper drying, bagging)	MD	8 <input checked="" type="checkbox"/>	1,500 =	12,000
Marketing	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500
Total Labour Needs (work-days)			MWK	105,000
3. Total Money-Out			MWK	133,000
4. Money-In				
Production <input checked="" type="checkbox"/> Selling price	kg	800 <input checked="" type="checkbox"/>	500 =	400,000
5. Profit or Loss? (Money-In MINUS Money-Out = Gross Margin)			MWK	267,000
6. Unit Cost (Total Money-Out / Production)			MWK/ Kg	166

Comparing Result

Please compare and tell what is good and what bad business is and indicate reasons.

Product				
		Fish	Soybean	Maize
Land/pond size	sqm or ha	200 sqm	1ha	1ha
Production	kg	35	800	1,300
Price	MWK/kg	2,500	500	150
1. Money-Out	MWK/ha			
2. Money-In	MWK/ha			
3. Profit or Loss?	MWK/ha			
Ranking (based on Profit/Loss)		☹️	😊	☹️

NOTE: The pond size is 200sqm and has given a profit of MK27,350. Assuming that this pond was at 1 hectare land then the profit could be MK1,367,500.00

Main Lessons

1. The agricultural entrepreneur (man or woman) knows if he/she is doing successful business with an agricultural product by knowing his/her Money-In and Money-Out.
2. He/she tracks the inputs and labour used in a field or for the pond and calculates the Money-In and Money-Out.
3. From the Money-In the agricultural entrepreneur subtracts the Money-Out. The result tells him/her if he/she made a profit or loss.
4. The agricultural entrepreneur makes a **profit** if the Money-In is greater than the Money-Out. In that case he/she is doing **good business**.
5. The agricultural entrepreneur (man or woman) makes a **loss** if the Money-Out is greater than the Money-In. In that case he/she is doing **bad business**.
6. You recognise a **loss** by the minus sign (-) in front of the number.
7. The good agricultural entrepreneur will abandon this enterprise or use a better technique to make a profit.
8. To make sure that he/she will make a profit, the agricultural entrepreneur calculates Money-In and Money-Out **before production**.

Module 5 Decisions for doing good business

Exercise Tilapia






















One 200 sqm pond - stock density 3 fish/sqm, mortality rate 5% intermittent harvest - expected yield 110kg

















		Tilapia Current (200sqm)			Tilapia Improved (200sqm)		
Unit	Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)	
1. Money-Out – Inputs and Services							
Fingerlings	Each	400 <input type="text" value="x"/>	35 <input type="text" value="="/>	14,000	600 <input type="text" value="x"/>	35 <input type="text" value="="/>	
Organic fertiliser	100kg bag	2 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	4,000	10 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
Lime	50kg bag	- <input type="text" value="x"/>	<input type="text" value="="/>		0.2 <input type="text" value="x"/>	12,000 <input type="text" value="="/>	
Maize bran	20 kg bag	6 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	12,000	25 <input type="text" value="x"/>	2,000 <input type="text" value="="/>	
Transport of feed & fingerlings	lumpsum	2 <input type="text" value="x"/>	3,000 <input type="text" value="="/>	6,000	2 <input type="text" value="x"/>	3,000 <input type="text" value="="/>	
Packing of fingerlings	lumpsum	1 <input type="text" value="x"/>	150 <input type="text" value="="/>	150	1 <input type="text" value="x"/>	150 <input type="text" value="="/>	
Transport to market	lumpsum	1 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	1,500	1 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Total Cost of Inputs and Services			MWK	37,650			
2. Money-Out – Labour							
Pond preparation	MD	3 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	4,500	3 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Slushing of dikes	MD	4 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	6,000	3 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Fertilising & lime application	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	750	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
stocking of fingerlings	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	750	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Feeding	MD	6 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	9,000	10 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Checking & Weighing & Observing	MD	<input type="text" value="x"/>	<input type="text" value="="/>		6 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Harvesting	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	750	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Marketing & sales	MD	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	750	0.5 <input type="text" value="x"/>	1,500 <input type="text" value="="/>	
Total Labour Needs	MD	15		22,500			
3. Total Money-Out			MWK	60,150	MWK		
4. Money-In							
Production <input type="text" value="x"/>	Kg	35 <input type="text" value="x"/>	2,500 <input type="text" value="="/>	87,500	110 <input type="text" value="x"/>	2,500 <input type="text" value="="/>	
5. Profit or Loss? (Money in MINUS Money-Out = Gross Margin)			MWK	27,350	MWK		
6. Unit Cost (Total Money-Out / Production)			MWK/kg	1,718.57	MWK/kg		

Exercise Maize



	Unit	Maize Current (1 ha)			Maize Improved (1 ha)		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money out – Inputs & Services							
Seed 	kg	25 <input checked="" type="checkbox"/>	1,800 =	45,000	25 <input checked="" type="checkbox"/>	2,000 =	
Herbicide - Pre-emergence 	Litre	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	12,000 =	
Herbicide - Post-emergence 	Litre	<input checked="" type="checkbox"/>	=		0.5 <input checked="" type="checkbox"/>	16,000 =	
Fertilizer Basal NPK 	50 kg	2 <input checked="" type="checkbox"/>	22,000 =	44,000	4 <input checked="" type="checkbox"/>	22,000 =	
Fertilizer Top Dressing 	50 kg	2 <input checked="" type="checkbox"/>	19,500 =	39,000	4 <input checked="" type="checkbox"/>	19,500 =	
Pesticides - e.g. stalkborer 	200 ml	<input checked="" type="checkbox"/>	=		3 <input checked="" type="checkbox"/>	3,000 =	
Pesticides - Actellic Super 	50 gr	4 <input checked="" type="checkbox"/>	2,000 =	8,000	12 <input checked="" type="checkbox"/>	2,000 =	
Empty bags 	50 kg	26 <input checked="" type="checkbox"/>	150 =	3,900	78 <input checked="" type="checkbox"/>	150 =	
Transport field to house 	Load	4 <input checked="" type="checkbox"/>	2,000 =	8,000	12 <input checked="" type="checkbox"/>	2,000 =	
Transport to market 	Fee/bag	26 <input checked="" type="checkbox"/>	700 =	18,200	78 <input checked="" type="checkbox"/>	700 =	
Cost of Inputs and Services			MWK	166,100		MWK	
2. Money Out - Labour							
Land preparation 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	15 <input checked="" type="checkbox"/>	1,500 =	
Planting 	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500	2 <input checked="" type="checkbox"/>	1,500 =	
Herbicide applications 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	
Fertilizer applications 	MD	8 <input checked="" type="checkbox"/>	1,500 =	12,000	4 <input checked="" type="checkbox"/>	1,500 =	
Gap filling 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	
Weeding 	MD	16 <input checked="" type="checkbox"/>	1,500 =	24,000	2 <input checked="" type="checkbox"/>	1,500 =	
Harvesting / Stooking 	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500	10 <input checked="" type="checkbox"/>	1,500 =	
Post-Harvest handling – de- husking, Shelling, winnowing, bagging 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	20 <input checked="" type="checkbox"/>	1,500 =	
Pesticide application - storage	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500	1 <input checked="" type="checkbox"/>	1,500 =	
Marketing 	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500	1 <input checked="" type="checkbox"/>	1,500 =	
Total Labour Needs	MD	66	MWK	99,000		MWK	
3. Total Money Out			MWK	265,100		MWK	
4. Money in							
Production <input checked="" type="checkbox"/> Sales price	kg	1,300 <input checked="" type="checkbox"/>	150 =	195,000	3,900 <input checked="" type="checkbox"/>	150 =	
5. Profit or Loss? Money in MINUS Money Out			MWK	-70,100		MWK	
6. Unit Cost (Total Money Out/Production)			MWK	204		MWK	

Exercise Soybean

	Unit	Soybean Current (1 ha)			Soybean Improved (1 ha)		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money out – Inputs & Services							
Seed - own vs. certified, single row vs. double row 	kg	40 <input checked="" type="checkbox"/>	260 =	10,400	80 <input checked="" type="checkbox"/>	1,700 =	
Inoculum	50 gr	<input checked="" type="checkbox"/>	=		8 <input checked="" type="checkbox"/>	1,250 =	
Herbicide - Post-emergence 	Litre	<input checked="" type="checkbox"/>	=		0.5 <input checked="" type="checkbox"/>	16,000 =	
Fertilizer Basal NPK 	50 kg	<input checked="" type="checkbox"/>	=		2 <input checked="" type="checkbox"/>	22,000 =	
Empty bags 	50 kg	16 <input checked="" type="checkbox"/>	150 =	2,400	48 <input checked="" type="checkbox"/>	150 =	
Mechanical shelling	Fee/bag				48 <input checked="" type="checkbox"/>	150 =	
Transport field to house 	Load	2 <input checked="" type="checkbox"/>	2,000 =	4,000	5 <input checked="" type="checkbox"/>	2,000 =	
Transport to market 	Fee/bag	16 <input checked="" type="checkbox"/>	700 =	11,200	48 <input checked="" type="checkbox"/>	700 =	
Cost of Inputs and Services			MWK	28,000		MWK	
2. Money Out - Labour							
Land preparation 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	20 <input checked="" type="checkbox"/>	1,500 =	
Planting (+ inoculum) 	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500	5 <input checked="" type="checkbox"/>	1,500 =	
Herbicide application 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	
Fertilizer application 	MD	<input checked="" type="checkbox"/>	=		2 <input checked="" type="checkbox"/>	1,500 =	
Gap filling 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	
Weeding 	MD	16 <input checked="" type="checkbox"/>	1,500 =	24,000	3 <input checked="" type="checkbox"/>	1,500 =	
Banking 	MD	10 <input checked="" type="checkbox"/>	1,500 =	15,000	7 <input checked="" type="checkbox"/>	1,500 =	
Harvesting 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	30 <input checked="" type="checkbox"/>	1,500 =	
Post-Harvest handling - Threshing, winnowing, etc. 	MD	8 <input checked="" type="checkbox"/>	1,500 =	12,000	6 <input checked="" type="checkbox"/>	1,500 =	
Marketing 	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500	2 <input checked="" type="checkbox"/>	1,500 =	
Total Labour Needs	MD	70	MWK	105,000		MWK	
3. Total Money Out			MWK	133,000		MWK	
4. Money in							
Production <input checked="" type="checkbox"/> Sales price	kg	800 <input checked="" type="checkbox"/>	500 =	400,000	2,400 <input checked="" type="checkbox"/>	500 =	
5. Profit or Loss? Money in MINUS Money Out			MWK	267,000		MWK	
6. Unit Cost (Total Money Out/Production)			MWK	166		MWK	

Explanation of fixed costs

Some costs are called fixed costs. Fixed costs are costs for equipment and tools that the producer owns and uses on various crops for several years – e.g. irrigation pumps, tractors and sprayer.

Main Lessons

1. The Difference between Money-In and Money-Out indicates whether we are making a loss or profit from the use of the land.
2. The Unit Cost of a crop indicates if it can compete on the international market with the same crop produced elsewhere. In the case of food crops, the Unit Cost indicates if it is better to buy the crop on the market.
3. The good agricultural entrepreneur (man or woman) calculates well ahead of the season to decide what he/she will produce and which techniques to use.
4. During the production season the good agricultural entrepreneur (man or women) registers money spent for farm operations and inputs.
5. After the harvest, the good agricultural entrepreneur (man or woman) evaluates his/her profit and identifies what changes are needed to improve the planning and profit for the next production season.























Module 5 – Solution to Exercise Tilapia

One 200 sqm pond - stock density 3 fish/sqm, mortality rate 5% intermittent harvest – expected yield 110kg
















		Tilapia Current (200sqm)			Tilapia Improved (200sqm)		
Unit	Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)	
1. Money-Out – Inputs and Services							
Fingerlings	Each	400 <input type="checkbox"/>	35 =	14,000	600 <input type="checkbox"/>	35 =	21,000
Organic fertiliser	100kg bag	2 <input type="checkbox"/>	2,000 =	4,000	10 <input type="checkbox"/>	2,000 =	20,000
Lime	50kg bag	- <input type="checkbox"/>	=		0.2 <input type="checkbox"/>	12,000 =	2,400
Maize bran	20 kg bag	6 <input type="checkbox"/>	2,000 =	12,000	25 <input type="checkbox"/>	2,000 =	50,000
Transport of feed & fingerlings	lumpsum	2 <input type="checkbox"/>	3,000 =	6,000	2 <input type="checkbox"/>	3,000 =	6,000
Packing of fingerlings	lumpsum	1 <input type="checkbox"/>	150 =	150	1 <input type="checkbox"/>	150 =	150
Transport to Makert	Lumpsum	1 <input type="checkbox"/>	1,500 =	1,500	1 <input type="checkbox"/>	1,500 =	1,500
Total Cost of Inputs and Services				MWK	37,650		101,050
2. Money-Out – Labour							
Pond preparation	MD	3 <input type="checkbox"/>	1,500 =	4,500	3 <input type="checkbox"/>	1,500 =	4,500
Slushing of dikes	MD	4 <input type="checkbox"/>	1,500 =	6,000	3 <input type="checkbox"/>	1,500 =	4,500
Fertilising & lime application	MD	0.5 <input type="checkbox"/>	1,500 =	750	0.5 <input type="checkbox"/>	1,500 =	750
stocking of fingerlings	MD	0.5 <input type="checkbox"/>	1,500 =	750	0.5 <input type="checkbox"/>	1,500 =	750
Feeding	MD	6 <input type="checkbox"/>	1,500 =	9,000	10 <input type="checkbox"/>	1,500 =	15,000
Checking & Weighing & Observing	MD	<input type="checkbox"/>	=		6 <input type="checkbox"/>	1,500 =	9,000
Harvesting	MD	0.5 <input type="checkbox"/>	1,500 =	750	0.5 <input type="checkbox"/>	1,500 =	750
Marketing & sales	MD	0.5 <input type="checkbox"/>	1,500 =	750	0.5 <input type="checkbox"/>	1,500 =	750
Total Labour Needs	MD	15		22,500	24		36,000
3. Total Money-Out				MWK	60,150	MWK	137,050
4. Money-In							
Production <input type="checkbox"/>	Kg	35 <input type="checkbox"/>	2,500 =	87,500	110 <input type="checkbox"/>	2,500 =	275,000
5. Profit or Loss? (Money in MINUS Money-Out = Gross Margin)				MWK	27,350	MWK	137,950
6. Unit Cost (Total Money-Out / Production)				MWK/kg	1,718.57	MWK/kg	1,245.91

Module 5 – Solution to Exercise Maize



	Unit	Maize Current (1 ha)			Maize Improved (1 ha)		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money out – Inputs & Services							
Seed 	kg	25 <input checked="" type="checkbox"/>	1,800 =	45,000	25 <input checked="" type="checkbox"/>	2,000 =	50,000
Herbicide - Pre-emergence 	Litre	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	12,000 =	12,000
Herbicide - Post-emergence 	Litre	<input checked="" type="checkbox"/>	=		0.5 <input checked="" type="checkbox"/>	16,000 =	8,000
Fertilizer Basal NPK 	50 kg	2 <input checked="" type="checkbox"/>	22,000 =	44,000	4 <input checked="" type="checkbox"/>	22,000 =	88,000
Fertilizer Top Dressing 	50 kg	2 <input checked="" type="checkbox"/>	19,500 =	39,000	4 <input checked="" type="checkbox"/>	19,500 =	78,000
Pesticides - e.g. stalkborer 	200 ml	<input checked="" type="checkbox"/>	=		3 <input checked="" type="checkbox"/>	3,000 =	9,000
Pesticides - Actellic Super 	50 gr	4 <input checked="" type="checkbox"/>	2,000 =	8,000	12 <input checked="" type="checkbox"/>	2,000 =	24,000
Empty bags 	50 kg	26 <input checked="" type="checkbox"/>	150 =	3,900	78 <input checked="" type="checkbox"/>	150 =	11,700
Transport field to house 	Load	4 <input checked="" type="checkbox"/>	2,000 =	8,000	12 <input checked="" type="checkbox"/>	2,000 =	16,000
Transport to market 	Fee/bag	26 <input checked="" type="checkbox"/>	700 =	18,200	78 <input checked="" type="checkbox"/>	700 =	54,600
Cost of Inputs and Services			MWK	166,100		MWK	351,300
2. Money Out - Labour							
Land preparation 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	15 <input checked="" type="checkbox"/>	1,500 =	22,500
Planting 	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500	2 <input checked="" type="checkbox"/>	1,500 =	3,000
Herbicide applications 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	1,500
Fertilizer applications 	MD	8 <input checked="" type="checkbox"/>	1,500 =	12,000	4 <input checked="" type="checkbox"/>	1,500 =	6,000
Gap filling 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	1,500
Weeding 	MD	16 <input checked="" type="checkbox"/>	1,500 =	24,000	2 <input checked="" type="checkbox"/>	1,500 =	3,000
Harvesting / Stooking 	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500	10 <input checked="" type="checkbox"/>	1,500 =	15,000
Post-Harvest handling – de- husking, Shelling, winnowing, bagging 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	20 <input checked="" type="checkbox"/>	1,500 =	30,000
Pesticide application - storage 	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500	1 <input checked="" type="checkbox"/>	1,500 =	1,500
Marketing 	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500	1 <input checked="" type="checkbox"/>	1,500 =	1,500
Total Labour Needs	MD	66	MWK	99,000	57	MWK	85,500
3. Total Money Out			MWK	265,100		MWK	436,800
4. Money in							
Production <input checked="" type="checkbox"/> Sales price	kg	1,300 <input checked="" type="checkbox"/>	150 =	195,000	3,900 <input checked="" type="checkbox"/>	150 =	585,000
5. Profit or Loss? Money in MINUS Money Out			MWK	-70,100		MWK	148,200
6. Unit Cost (Total Money Out/Production)			MWK	204		MWK	112




Module 5 – Solution to Exercise Soybean

	Unit	Soybean Current (1 ha)			Soybean Improved (1 ha)		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money out – Inputs & Services							
Seed - own vs. certified, single row vs. double row 	kg	40 <input checked="" type="checkbox"/>	260 =	10,400	80 <input checked="" type="checkbox"/>	1,700 =	102,000
Inoculum	50 gr	<input checked="" type="checkbox"/>	=		8 <input checked="" type="checkbox"/>	1,250 =	10,000
Herbicide - Post-emergence 	Litre	<input checked="" type="checkbox"/>	=		0.5 <input checked="" type="checkbox"/>	16,000 =	8,000
Fertilizer Basal NPK 	50 kg	<input checked="" type="checkbox"/>	=		2 <input checked="" type="checkbox"/>	22,000 =	44,000
Empty bags 	50 kg	16 <input checked="" type="checkbox"/>	150 =	2,400	48 <input checked="" type="checkbox"/>	150 =	7,200
Mechanical shelling 	Fee/bag				48 <input checked="" type="checkbox"/>	150 =	7,200
Transport field to house 	Load	2 <input checked="" type="checkbox"/>	2,000 =	4,000	5 <input checked="" type="checkbox"/>	2,000 =	10,000
Transport to market 	Fee/bag	16 <input checked="" type="checkbox"/>	700 =	11,200	48 <input checked="" type="checkbox"/>	700 =	33,600
Cost of Inputs and Services			MWK	28,000		MWK	222,000
2. Money Out - Labour							
Land preparation 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	20 <input checked="" type="checkbox"/>	1,500 =	30,000
Planting (+ inoculum) 	MD	5 <input checked="" type="checkbox"/>	1,500 =	7,500	5 <input checked="" type="checkbox"/>	1,500 =	7,500
Herbicide application 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	1,500
Fertilizer application 	MD	<input checked="" type="checkbox"/>	=		2 <input checked="" type="checkbox"/>	1,500 =	3,000
Gap filling 	MD	<input checked="" type="checkbox"/>	=		1 <input checked="" type="checkbox"/>	1,500 =	1,500
Weeding 	MD	16 <input checked="" type="checkbox"/>	1,500 =	24,000	3 <input checked="" type="checkbox"/>	1,500 =	4,500
Banking 	MD	10 <input checked="" type="checkbox"/>	1,500 =	15,000	7 <input checked="" type="checkbox"/>	1,500 =	10,500
Harvesting 	MD	15 <input checked="" type="checkbox"/>	1,500 =	22,500	30 <input checked="" type="checkbox"/>	1,500 =	22,500
Post-Harvest handling - Threshing, winnowing, etc. 	MD	8 <input checked="" type="checkbox"/>	1,500 =	12,000	6 <input checked="" type="checkbox"/>	1,500 =	9,000
Marketing 	MD	1 <input checked="" type="checkbox"/>	1,500 =	1,500	2 <input checked="" type="checkbox"/>	1,500 =	3,000
Total Labour Needs	MD	70	MWK	105,000	62	MWK	93,000
3. Total Money Out			MWK	133,000		MWK	315,000
4. Money in							
Production <input checked="" type="checkbox"/> Sales price	kg	800 <input checked="" type="checkbox"/>	500 =	400,000	2,400 <input checked="" type="checkbox"/>	500 =	1,200,000
5. Profit or Loss? Money in MINUS Money Out			MWK	267,000		MWK	885,000
6. Unit Cost (Total Money Out/Production)			MWK	166		MWK	131

Module 6 Diversifying your farm enterprise for more income

After all the calculations, we will determine the opportunities to increase revenues. By looking at the numbers on this page we will learn how to make investment decisions. We will determine the best opportunities as follows:

- Rank crops based on Profit or Loss
- What crops and techniques will you choose?
- Make a choice based on this ranking

		 Tilapia				 Maize		 Soyabean	
		Current		Improved		Current	Improved	Current	Improved
	Unit	1 pond	5 ponds	1 pond	5 ponds	1 ha	1 ha	1 ha	1 ha
Surface Area	sqm or ha	200sqm	0.1 ha	200sqm	0.1 ha	1 ha	1 ha	1 ha	1 ha
Mortality	%	30%	30%	30%	30%				
Production	kg	35	175	110	550	1,300	3,900	800	2,400
Price	MWK	2,500	2,500	2,500	2,500	150	150	500	500
1. Money-In	MWK/ha	87,500		275,000	1,375,000	195,000		400,000	
2. Money-Out	MWK/ha	60,150		137,050	685,250	265,100		133,000	
3. Profit or Loss?	MWK/ha	27,350		137,950	689,750	-70,100		267,000	
Rank (based on profit/loss)									

What is a risk in aquaculture and in agriculture?

Risk is defined as any factor that may cause losses to the farm business.

The agricultural entrepreneur (**man or woman**) does not like risks because they are difficult to predict. However, one can determine during the planning what the impact of risks could be on revenues.

We use an example below to learn this.

Production Risks	Market Risks
<p>Due to a lack of rains the yield of soybean falls to</p> <ul style="list-style-type: none"> ▪ 480 kg / ha (current technique) ▪ 1,440 kg/ha (improved technique) 	<p>Imports which are not fairly regulated flood the market.</p> <ul style="list-style-type: none"> ○ e.g. maize prices and prices of other products drops ○ Tilapia price drops from 2,500 MWK to 2,000 MWK



Let us have a look at what the implications are on revenues in the case of the above production and marketing risks.

- Calculate the changes to Money-In and resulting Profit. Money-Out remains unchanged as the money is already spent.
- Rank crops once more based on Profit or Loss using the tables below
- Register the results in the preceding table to compare the results with the situation without risk

Production Risk The yield for Soya current and improved are reduced due to lack of rains		Soybean		Tilapia	
		Unit	Current	Improved	Current
Production size		1 ha	1 ha	5 x 200 sqm	5x 200 sqm
Production	kg	480	1,440	175	550
Price	MWK	500	500	2,500	2,500
1. Money-In	MWK/ha			437,500	1,375,000
2. Money-Out	MWK/ha	133,000	315,000	300,750	685,250
3. Profit or Loss?	MWK/ha			136,750	689,750
Rank (Profit)		☹	☺	☺	☺

Marketing Risk.

Sales price for Tilapia is lower than expected (current and improved)

					
		Soybean		Tilapia	
	Unit	Current	Improved	Current	Improved
Production size		1 ha	1 ha	5 x 200 sqm	5x 200 sqm
Production	kg	800	2,400	175	550
Price	MWK	500	500	2,000	2,000
1. Money-In	MWK/ha	400,000	1,200,000		
2. Money-Out	MWK/ha	133,000	315,000	300,750	685,250
3. Profit or Loss?	MWK/ha	267,000	885,000		
Rank (profit)		☺	☺	☹	☺

Risk-Management Strategies

Some risks can be managed. Examples of risks and risk-reducing strategies are:

Table presents risks in fish farming in Malawi among small-scale fish farmers. ¹

Risk	Frequency of Occurrence	% Fish Loss	Comments
Poor management	Slow growth	up to 50% (depending on stocking density)	To attain reasonable growth, fish require some form of feeding, be it fertilization of the pond, feeding using ag by-products or an imported complete feed. This can be best managed, if fish growth is continuously monitored by checking and weighing.
Mortalities at Stocking	1 x/year	up to 10%	Only if fingerlings poorly handled and stressed. Improved handling and stocking with larger fingerlings reduces this risk to minimum.
Predation	monthly	3%	Predation from birds, and snakes are minor and result in loss of injured or weak fish. Otters however are aggressive predators and can cause significant loss. Use of scarecrows, reflective aluminum strips flapping in the breeze can reduce bird predation. A large mesh net placed across middle inside water of a pond can be effective.
Theft	1 time/100 ponds	2%	As production increases poaching fish by thieves increases using a line and hook or a net. Farmers need to be observant of conditions around their ponds as thieves usually leave a trace. Poachers usually steal fish at night. Guards are needed at high producing farms.
Flooding	1 x/ every 3 years	up to 100 %	Flooding risk is generally low but may occur once each 3 years with significant loss of fish
Low water table	1x / year	2%	Ponds built in the water table or low lying areas are uncontrollable and not recommended. The most successful aquacultural entrepreneurs have ponds fed by streams; such ponds can be filled or drained anytime.

¹ COFAD 2021

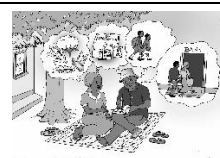
Main Lesson

1. Comparing profits of different crops and production techniques helps the agricultural entrepreneur to make decisions about using the land, labour and capital to maximise revenue. This comparison is important for all agricultural entrepreneurs (men or women).
2. Production decisions are based on these comparisons.
3. The good agricultural entrepreneur (man or woman) knows that a fluctuation in prices constitutes a risk on revenue. Risks are a concern for traditional as well as improved techniques, be it crop or animal production.
4. To evaluate the impacts of market risk, the producer calculates the Money-In with a much lower price (“pessimistic”) than the current price (or last season’s price). If the “pessimistic” profit can still satisfy the revenue objectives, then the risk is acceptable.
5. The good agricultural entrepreneur (man or woman) seeks actively for information in prices and markets
6. Production risks can be reduced using risk-management strategies and following recommendations for pond establishment and protection methods.

Module 7 Manage your money throughout the year

Management of money

- How does one know if the money is managed badly?
- What are the causes?
- How to manage money well during the year?



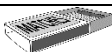






**One must plan!
The person, who fails to plan, plans to fail!**

First step: Foresee household expenditure

We have looked at « Money In » and « Money Out » for different crops on the farm.

Now we will have a look at the expenditures of a household of 6 persons (2 of the children not yet in school, 2 children in primary school). How much money is needed for the household in one year? Can we foresee these expenditures? When is the money needed?



Money needs of the household	Can be foreseen?	Period/Month	Money-Out	
			MWK per period/month	MWK per year
Matches 	yes	Each month	200	2,400
Salt 	yes	Each month	1,400	16,800
Soap 	yes	Each month	900	10,800
Candles	yes	Each month	2,000	24,000
Purchase food 	yes	Each month	50,000	600,000
Subtotal each month / per year MWK				
School uniforms for 2 children 	yes	September	15,000	15,000
Clothing at end of the year and in June 	yes	Dec/June	25,000	25,000
Happy events 	yes	December	12,000	12,000
Unexpected events	yes	Anytime	10,000	10,000
Annual money needs for household MWK				

In this exercise we will now consider a household managing 5 ponds each 200 sqm, 1 ha of field for maize and 1 ha of soybean. We are looking at how expenditures and income are spread over the year for both current and improved production techniques as in Module 6, and then look if the money needed for the household is really available.

Module 7 Exercise: Financial Calendar for a farm using current practices (MWK) – 2 ha field and 5 x 200 sqm ponds for tilapia

Money-Out		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Tilapia	5*200mq													
	Inputs and Services	37,650				37,650				37,650	37,650	37,650		188,250
	Labor Costs	22,500				22,500				22,500	22,500	22,500		112,500
Maize	1ha													
	Inputs and Services								83,050	83,050				166,100
	Labor Costs	19,800			19,800						19,800	19,800	19,800	99,000
Soybean	1ha													
	Inputs and Services								14,000	14,000				28,000
	Labor Costs	21,000			21,000						21,000	21,000	21,000	105,000
Total per month		100,950	0	0	40,800	60,150	0	0	97,050	157,200	100,950	100,950	40,800	698,850
Household monthly		54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	654,000
School fees and material										15,000				15,000
Happy Events													12,000	12,000
Unexpected Event			10,000											10,000
Clothing							25,000							25,000
Household Expenditure per month/year		54,500	64,500	54,500	54,500	54,500	79,500	54,500	54,500	69,500	54,500	54,500	66,500	716,000
Total per month		155,450	64,500	54,500	95,300	114,650	79,500	54,500	151,550	226,700	155,450	155,450	107,300	1,414,850
Money-In		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Tilapia						218,750		218,750						437,500
Maize							97,500	97,500						195,000
Soybean						200,000	200,000							400,000
Total money income from production per month		0	0	0	0	418,750	297,500	316,250	0	0	0	0	0	1,032,500
Other income													150,000	150,000
Total money income from production and other sources		0	0	0	0	418,750	297,500	316,250	0	0	0	0	150,000	1,182,500
Result		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Monthly balance (Money in - Money out)		-155,450	-64,500	-54,500	-95,300	304,100	218,000	261,750	-151,550	-226,700	-155,450	-155,450	42,700	-232,350
Cumulative balance (Money in -Money out)		-155,450	-219,950	-274,450	-369,750	-65,650	152,350	414,100	262,550	35,850	-119,600	-275,050	-232,350	

Module 7 Exercise: Financial Calendar for a farm using improved practices (MWK) – 2 ha field and 5 x 200 sqm ponds for tilapia

Money-Out		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Tilapia	5*200mq													
	Inputs and Services	101,050		101,050	101,050				101,050	101,050				505,250.00
	Labor Costs	36,000		36,000	36,000				36,000	36,000				180,000.00
Maize	1.0 ha													
	Inputs and Services								175,650	175,650				351,300.00
	Labor Costs	17,100			17,100						17,100	17,100	17,100	85,500.00
Soybean	1.0 ha													
	Inputs and Services								111,000	111,000				222,000.00
	Labor Costs	18,600			18,600						18,600	18,600	18,600	93,000.00
Total per month		172,750	0	137,050	172,750	0	0	0	423,700	423,700	35,700	35,700	35,700	1,437,050.00
Household		54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	54,500	654,000.00
School fees and material										15,000				15,000.00
Clothing							25,000							25,000.00
Happy Events													12,000	12,000.00
Unexpected events				10,000										10,000.00
Household Expenditure per month/year		54,500	54,500	64,500	54,500	54,500	79,500	54,500	54,500	69,500	54,500	54,500	66,500	716,000.00
Total expenditure per month/year		227,250	54,500	201,550	227,250	54,500	79,500	54,500	478,200	493,200	90,200	90,200	102,200	2,153,050.00
Money-In		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Tilapia				343,750		343,750			343,750	343,750				1,375,000.00
Maize										292,500	292,500			585,000.00
Soybean											600,000	600,000		1,200,000.00
Total money income from production per		0	0	343,750	0	343,750	0	0	343,750	636,250	892,500	600,000	0	3,160,000.00
Other income													150,000	150,000.00
Total money income from production and		0	0	687,500	0	687,500	0	0	687,500	1,272,500	1,785,000	1,200,000	150,000	6,470,000.00
Money-In		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Monthly balance (Money in - Money out)		-227,250	-54,500	485,950	-227,250	633,000	-79,500	-54,500	209,300	779,300	1,694,800	1,109,800	47,800	4,316,950.00
Cumulative balance (Money in -Money out)		-227,250	-281,750	204,200	-23,050	609,950	530,450	475,950	685,250	1,464,550	3,159,350	4,269,150	4,316,950	

Let's discuss the results using this overview

			With current production techniques	With improved production techniques
	Can be foreseen?	Period-month	Per year (MWK)	Per year (MWK)
Money-Out for household	Yes	Each month	716,000	716,000
Money-Out for inputs, services and labour	Yes	Different months	698,850	1,437,050
Total Money-Out for household and production	Yes	Different months		
Money-In from production	Yes, but can change	Different months	1,032,500	3,160,000
Money-In from other sources	Yes, but can change	Different months	150,000	150,000
Total Money-In from production and other sources	Yes, but can change	Different months		
Money available for next season, other expenditure including labour, and savings (MWK) Total Money-In from production and other sources minus Total Money-Out for household and production				

Difference between the two situations	MWK	
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Main Lessons

1. In the agricultural enterprise, expenditures (Money-Out) for the farm and the household are made each month, but the revenue (Money-In) comes only during the months of harvest or sale of produce. Therefore there are months of the year where the expenditures are greater than the revenues. These months are called “**deficit months.**”
2. For this reason, the good agricultural entrepreneur (man or woman) makes a financial calendar. He or she plans with the spouse(s) the expenditures for production and household needs.
3. To cover the expenditures in deficit months, the good agricultural entrepreneur saves money from the sales of produce (“surplus months”).
4. Improved techniques can improve the revenues of the agricultural entrepreneur.
5. The needs for Inputs can be identified with calculations of Gross Margin and the Financial Calendar. This information can be used to make savings in a targeted way or to solicit credit for production.

Module 8 How to get good financial services

Objectives:

- Learn about financial services and become an informed financial decision-maker
- Learn about basic skills related to earning, spending, saving and borrowing
- Strengthen and sustain financially-responsible behaviours that will lead to increased savings, prudent spending, and borrowing for productive purposes
- Understand what you need to keep in mind when getting financial services

Savings

Saving is when money is put aside by an individual or household in the present for use in the future. Saving can also be done in the form of investments, animals or land, which can be sold when cash is needed and is a way of building assets.

Why is it important to create savings?

- With savings you can invest in your enterprise and thereby make greater revenue. For example, by buying fertilizer or improved seeds.
- If you save on a bank account, your money is safe.
- Savings on an account are often necessary to obtain a loan.

How can you create savings? What are the advantages and disadvantages?

	Hide money at home	Bring money to a bank
Advantage	<ol style="list-style-type: none"> 1. The money is immediately available 	<ol style="list-style-type: none"> 1. The money is safe at the bank 2. Having savings at the bank facilitates a loan from the bank 3. Saving at the bank reduces the risk of spending money impulsively because it is not immediately available
Disadvantage	<ol style="list-style-type: none"> 1. Money is not safe and can be stolen 2. Money can be destroyed (by a fire, for example). 3. There is increased risk of making impulsive expenditures 	<ol style="list-style-type: none"> 1. The money is not immediately available

Paying money into your bank account	Removing money from your bank account
<ul style="list-style-type: none"> • Go to the bank or village financial institution 	<ul style="list-style-type: none"> • Think why you need money, and how much • Go to the bank or the village financial institution
<ul style="list-style-type: none"> • Fill out the deposit form 	<ul style="list-style-type: none"> • Fill out the money withdrawal form
<ul style="list-style-type: none"> • Your deposit is registered in your savings booklet 	<ul style="list-style-type: none"> • Your withdrawal amount is registered in your savings booklet

Bank Deposits

Collection of money from the people



Commercial Banks, Savings and Credit Cooperatives (SACCO's) and some Microfinance Institutions (MFI's) collect money from people who have it to spare or who are saving it from their income. They keep the money safe on your account.

Your money can be put into **current, savings** and **fixed accounts**.

A **Current Account** allows the agricultural entrepreneur (man or woman) to always access money. Money put in this account can be taken out any time. You use a cheque to take out money or to pay a bill. The bank charges a fee for the services it has given to you for this account.

What saving products are being offered by financial service providers?

A **Savings Account** helps you to save money and keep it safe or with the objective to get a loan. You can take money only when you are present at the bank. The bank pays additional money on the money in this account every three months, every six months or every year. As owner of a savings account you receive a passbook from the bank into which money put in and money taken out is recorded.

A **Fixed Deposit Account** helps you to keep money safe and to earn more money. You can only take out your money after a certain time, that you have agreed with the bank, let us say six months. The money that is paid on top of the amount in this account depends on how long the money will be in this account. If for any reason, you want to take out the money before the time you have agreed with the bank, the bank charges you a fee. This type of account could be used by a farmer business person planning to put in more money into for example quality seed or fertilizer. For long-term fixed deposits can help you to build up more money and also interest over time, and thus can be used for investments, such as pond establishment

There are many advantages of depositing money. However, there are things that the agricultural entrepreneur (man/woman) should look into when opening a bank account, such as the direct costs that are associated with the account. Direct costs might be:

- Monthly account holding fees
- Withdrawal fees
- Costs for an ATM card
- Account opening fees

When visiting a financial institution, the agricultural entrepreneur makes sure to ask the officer for information on all of these and other costs.

There are also indirect costs that may be associated with a bank account and have to be taken into consideration, e.g. travel time and cost to reach the nearest bank branch, agent, or ATM.

Loans

What is Credit (Lending / Loan)?

It is money you borrow from a person or a bank promising to pay back this money. This is a service you get and you pay a fee for this service, which is called interest.

- A loan is money you borrow (credit) from a person or a bank.
- Money can be borrowed for a very short time (1 month to 12 months).
- Money can be borrowed for a short time (1 to 2 years)
- Money can also be borrowed for a long time (3 years onwards).
- Service fee (interest) can be charged every week or every two weeks, every month or every year on the money you borrowed.

Reasons people borrow:

- To invest
- To respond to an unexpected emergency
- To consume – to purchase an item for which they do not have enough money

Discussions





What are the responsibilities when borrowing?

- How did you feel when you lent something – anything – to someone that was not returned to you? What did you do?
- How did you feel when you failed to return something that you borrowed? What happened?
- When someone borrows something, what are their responsibilities as the borrower?
- What can happen if the borrower fails to meet their responsibilities as a borrower?

What is the difference between using your own money and using borrowed money?

- A loan costs money.
- A loan comes with obligations for the borrower, including repayment with interest and, in some cases, group membership.
- You have fewer obligations and responsibilities when you use your own money.
- By borrowing, you gain access to more financial capital

The most common sources of loans are summarized below.

Microfinance Institution	Informal Lender (Katapila)	Village Savings and Loans Association (VSLA)
		
Bank	SACCO	Loans from Friends and Family
		

What to know before borrowing:

- The use of the loan money you are intended to get
- The sources of income and/or savings you have to make those payments
- When you will actually get the loan
- The amount of your loan payment, including principal, interest and fees
 - Usually, interest is charged monthly as a percentage on the loan amount. Make sure that you really understand what the interest rate is, not only in a percentage but also in monetary terms
 - Loan processing fees as a percentage of the loan
 - Mandatory credit life insurance
- That the price you can charge for your goods financed with loan money is high enough to both repay the loan, interest and still make sufficient profit
- Understand the grace period before the first repayment is due

When you apply for a loan, the bank or MFI will demand a number of things from you before they consider giving you a loan. Some requirements could be:

- A valid ID card
- Proof of residence (e.g. utility bill or letter from the chief)
- Some form of collateral or compulsory savings

Depending from whom you borrow, the service fee (interest) you will have to pay will vary.

Let us have a closer look at how a bank provides a loan. After applying for the loan a bank will give you a letter telling you it has agreed to give you the money you have asked for. The bank also shows when you have to pay back the total amount of money.

You, the borrower and the bank know what will be the payments of the loan and service fee is being paid, and when is it to be paid. This makes planning very simple for all.

Example



John is a farmer from Malawi. He needs MWK 166,000 to buy fertilizer for his maize crop (1 ha). He decides to go to the bank to borrow this money.

The bank agrees to give John the money but told him, he has to pay back MWK 196,800 in 6 months

The MWK 166,000 John borrowed is the credit. John will have to pay MWK 30,800 as fee for the money he borrowed.

The 6 months is how long it will take until John has to pay back the money.

There are two common types of loans

- Business loans
- Personal loans

Business Loan

This loan is given to business men and women like farmers to make their business (farming) better or to increase the size of their business (farm increasing from 2.5 acres to 5 acres). They are given to the groups or to individuals. Examples of business loans are:

Agricultural Loan: This is a short time loan that can be used to buy planting material, seeds, fertilizer, insecticides, and herbicides.

Expansion Loan: This loan helps farmers to increase their farming business by increasing the cropping area.

Other investment loans: For other non-agriculture related businesses (expanding existing businesses e.g. groceries shops).

Personal Loan

This type of loan is not for business. It is rather used to buy things that are needed for the home like a solar system or to pay school fees.

Ways by which money can be borrowed

- You can borrow money as a single person (individual loan). In this case, the bank always asks for things like a building, a car or land to be put down before giving out the money. If you pay the loan back and the service fee in time, the bank will be happy to serve you in the future.
- You can borrow money as a member of a group (group solidarity loan). The group can be a VSLA or a registered Farmers' Association. If you pay the loan back and the service fee in time, the other group members will be happy to keep you in the group.



It is important that you pay back your loan plus the interest after the agreed time.

This way you can build a good relationship with the lender and make sure that next time you will get another loan at the same or maybe even better conditions!

Main Lessons:

1. The good agricultural entrepreneur (man or woman) plans his/her expenditures and money entries throughout the year to avoid shortages of money and unforeseen loans that are expensive.
2. To meet the needs of Money-In in deficit months, the good agricultural entrepreneur makes savings with the surplus money from product sales. It takes discipline to do so.
3. Saving money with a bank or a micro-finance institution which is close by has the advantage that money is safe. Another advantage is that one is obliged to plan for expenses before withdrawing money.
4. To know which bank account to open and use, the agricultural entrepreneur enquires about the conditions and associated cost.
5. There are different types of savings that offer various benefits. Banks and micro-finance institutions provide information and advice to assist their customers.
6. There are different types of loans. The good agricultural entrepreneur looks at the options and chooses the type of loan with convenient service fees and conditions for reimbursement.
7. The good agricultural entrepreneur takes a loan only when he/she is sure to be able to repay on time. For this reason, he/she plans the investments and expenditures required. The Gross Margin and the Financial Calendar are the appropriate tools for this planning.
8. Once a loan is received, the good agricultural entrepreneur sticks to the objective of the investment. Otherwise, he/she is likely to have repayment problems.
9. The good agricultural entrepreneur pays back his/her loan plus the interest in the agreed time. This way he/she can build a good relationship with the financial institution and make sure that next time he/she will get another loan with the same or maybe even better conditions.

Module 9 Make more money with improved feeding techniques and management

Performance overview

Fish growth parameters 200sqm pond	Unit	Current practice	Improved practice (improved maize bran)
1. Fingerlings at beginning of rearing	Animals	400	600
2. Live weight at beginning of rearing	grams per animal	5	5
3. Days of culture (DOC)	Days	365	270
4. Live weight at point of harvest	kg	35	110
5. Mortality	% (stocking to harvest)	30%	5%
6. Average live weight when sold	grams per animal	87.5	183.3
7. Average daily weight gain	gram per day	0.24	0.68
8. Feed conversion rate	gram feed per g live weight gained	3.4	3.5
9. Feed cost per kg fish produced [MKW/kg fish]	MWK/kg fish produced	343	350
10. Money-out	MWK/cycle	60,150	137,050
11. Unit costs	MWK /kg live weight	1,718.5	1,245.9
12. Selling price	MWK / kg live weight	2,500	2,500
13. Money-in	MWK / cycle	87,500	275,000
14. Profit	MWK /cycle	27,350	137,950
15. Profit per Unit	MWK/ kg live weight	781.4	1,254

Why these differences?	Who can change this?
The farmer does or does not apply the good pond management techniques	The farmer! Continuous monitoring of the pond (weight, mortality, feed) is key to do better business!

To do good business and make more income, the entrepreneur (man or woman) follows the advice given and applies all steps of Good Aquacultural Practices (GAP) to get the most benefit out of inputs and work.

Every step is important.
Every mistake makes you lose money and work.

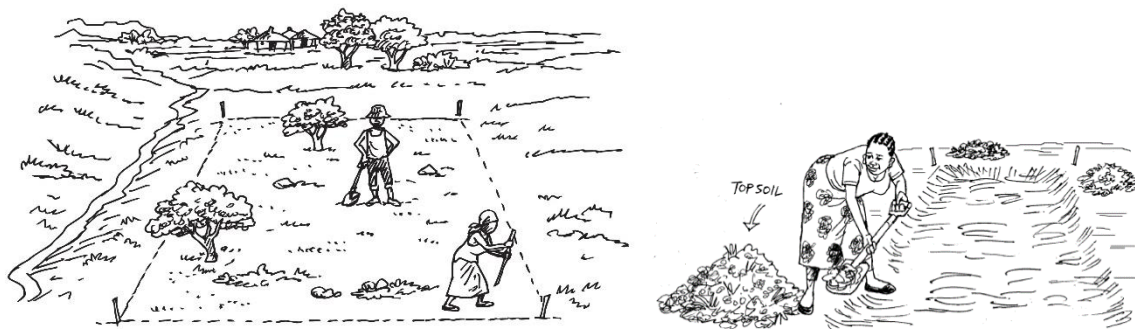
Site selection



Proper site selection is recognized as the first step guaranteeing the eventual success of any aquaculture activity and therefore forms the basis for proper design, layout, construction and management of an aquaculture enterprise. In fish farming, profitability depends primarily on the selection of a suitable site and therefore site selection is critical and should be given utmost attention. If site selection is not properly done, it may be expensive to operate a fish farming business. The following are the guidelines for the selection of a suitable site for fish ponds although may vary from one site to site:

- Soil suitability
- Topography of the land
- Proximity or accessibility
- Flooding incidence
- Climate
- Land and Water Rights
- Availability of fingerlings production objectives, environment and socio-economic factors
- Markets

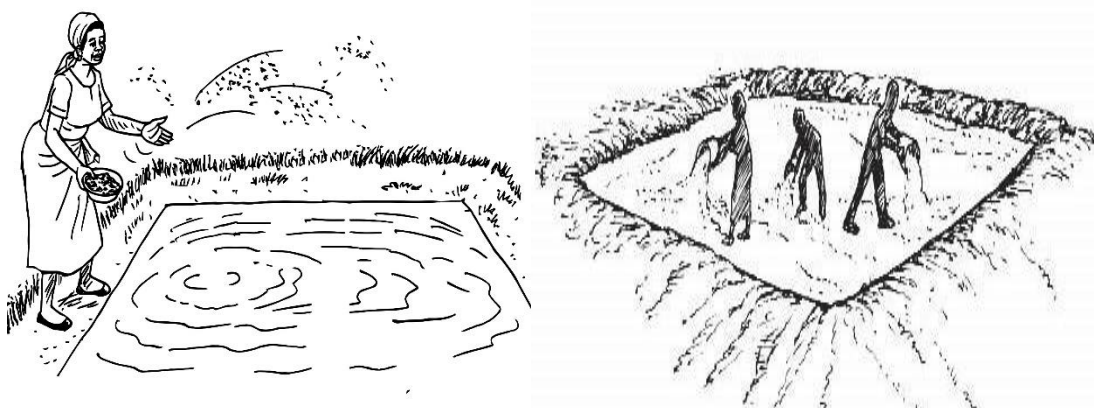
Pond construction



Before starting fish farming operations, farmers spend a good percentage of their fish farming expenses in construction of fishponds. They have to critically decide how many and what type of ponds they have to dig before making their first fish harvest. Before the construction works start, think of the design of the pond, the layout according to the land size, topography and source of water. Type of soils can also guide on how to design, layout and construct the ponds. Before constructing ponds, a farmer needs to check the type of soil, and whether the soil can hold water. Clay soil can hold water for a long time whereas land with sandy soil may not retain water for very long. Clay soils and similar types such as sandy clay and sandy loam soils are found in most areas, but most of the land available for aquaculture is unused or unfertile soils. It is likely that soil will not completely hold water and so a quick investigation is necessary. After considering the soil type, it is very important to fully understand the design and functions of facilities for running this particular pond farming system. Fish farmers are encouraged to construct and use of deeper ponds in colder areas and where water is a challenge as shallow ponds do give a number of challenges when it comes to profitable production.

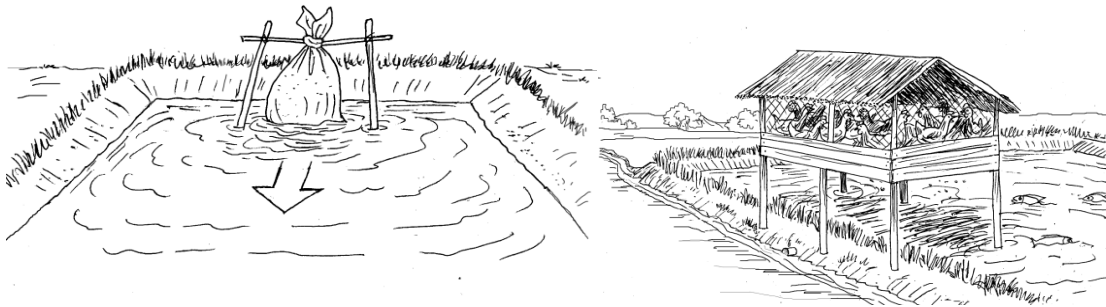
Pond liming

After construction, draining, drying and de-silting the pond, and before ponds are stocked with fish, they have to be limed. Liming will help improve pond soil quality, provides CO_2 for photosynthetic organisms and will help combat parasites within the pond. If ponds cannot be dried out completely, they should still be treated to eliminate any predatory fish or other pests. One common practice is to use agricultural lime which is relatively cheap and abundant. The lime should be applied evenly across the whole bottom. This can be done by manual broadcasting. It is not necessary to dig the lime into the soil; however this will improve its effectiveness. The liming process will remove the majority of unwanted organisms from the pond and improve the effectiveness of fertilization. After the lime has been applied, you can fill your pond to approximately half to two thirds. Thereafter, fertilization can begin.



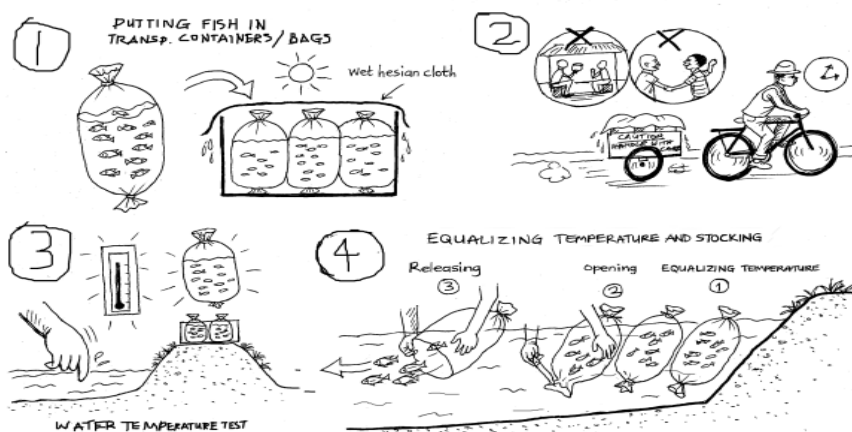
Pond fertilization

Fertilization is another step in preparing your pond. It provides nutrients to the water, which stimulate the growth of algae and other organisms, such as insects that provide a nutrient source for your fish. The purpose of fertilization in open pond aquaculture is to provide exogenous elementary nutrients (carbon, nitrogen and phosphorus) to enhance natural food in the water. More natural food means faster fish growth, and less supplementary feed will be added. Natural food includes tiny plants called phytoplankton, which are nearly buoyant in the water column, giving the water a greenish color. Algae can be consumed directly by fish or be food for zooplankton (tiny animals and water insects), which the fish can also eat. When fertilizing your pond, you can use either inorganic or organic fertilizers.

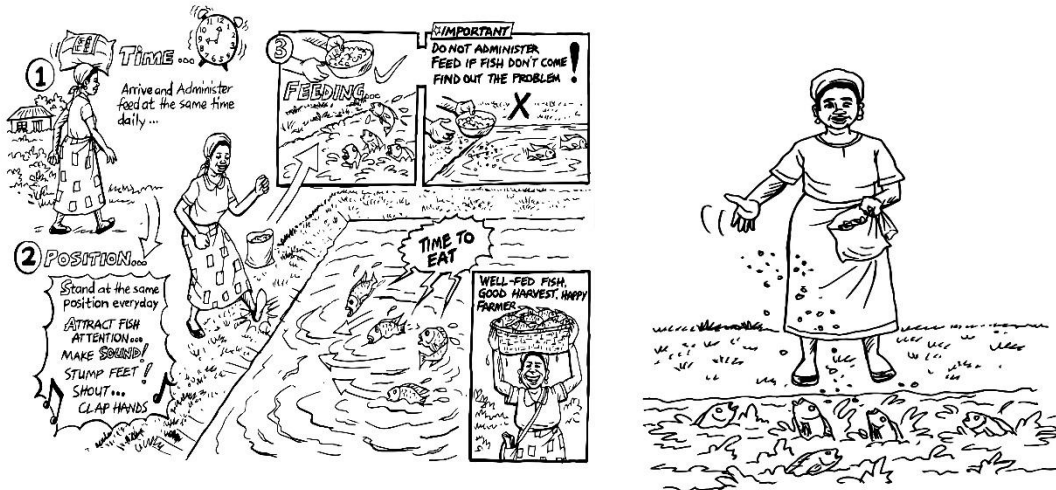


Pond stocking

Stocking fish seed (fingerlings) after pond preparation. The carrying capacity of the pond and level of management determines the stocking rates. The stocking rate will also vary according to the common fish culture practices in the surrounding area and the financial capability of farmers. For example, if the farm is using formulated feeds and has a stable supply of water, stocking rates can be increased. Stocking rates vary depending on the quality and availability of water, soil and capital as well as the desired marketing size of the fish.



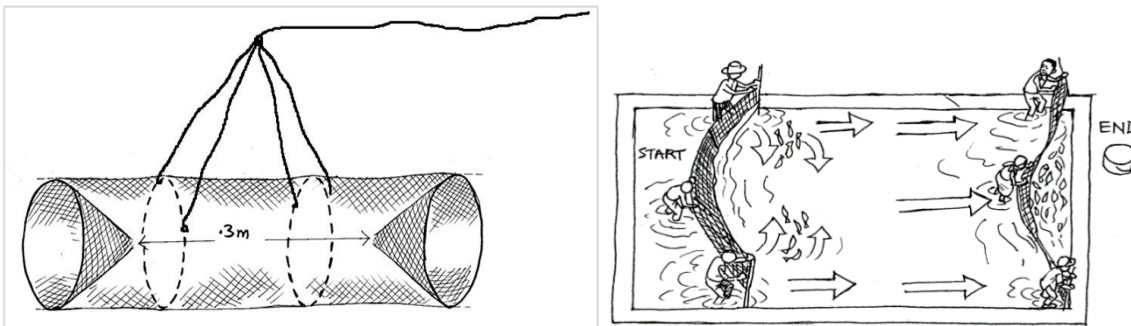
Feeding



Fish feeding is considered one of the most basic factors in increasing fish production in farms. And if cultured fish is to grow, it has to be fed with balanced feeds. Good nutrition in fish production systems is essential to economically produce a healthy, high quality product. As fish feeds with good nutrition are costly, the development of inexpensive, balanced diet formulations is of great importance. This will support aquaculture to satisfy the increasing demand for affordable, safe, and high-quality fish products. Fish meal is often used as a source of animal protein in fish diets, though it is costly. Considerations on the use of alternative unconditional feed ingredients as suitable replacements for fish meal in artificial diets for fish feed formulations especially use of plant protein sources such as soybean have been presented.

Harvesting

Aquaculture can be defined as a sustainable practice of fish harvesting that strives to keep aquatic biodiversity and ecosystems intact. And fish harvesting is one of the important pond corrective measures or practices in aquaculture. Fish must be harvested after a production cycle and farmers must adhere to a production cycle. If fish is not harvested the farmer will not get any benefits in return as feed and other resources will just be wasted. The duration of the cultivation is varied upon the agro-ecological zone, intensity of the farming, purpose of production, preferred market size for fish, seasons and by opportunities to achieve good volume of sales and market prices. Some fish harvests are influenced by for example, fortnight pay days and markets, paydays, festive times. For Tilapias, harvests can be done starting from about 3 – 6 months from the date fingerlings have been stocked



Pond maintainance

Your pond is producing less than it should provide? One of the common causes can be insufficient nutrients to support fish growth, especially in semi-intensive and extensive pond systems. Pond preparation is a key element in any pond production system. Pond preparation involves liming and fertilization to provide an ideal environment for tilapia and catfish to grow. Some of the steps you need to follow include the following: Draining, drying the pond, de-silting, weed removal, maintaining inlets and outlets, and maintaining dike shapes.

Record keeping

Analysis of any aquaculture enterprise (financial or biological), requires sound and up to date information (records). In aquaculture, farm records are the most reliable form of information one can use. Poor record keeping is probably one of the major reasons entrepreneurs fail. A recent case study of record keeping has been demonstrated in outbreak of EUS where fish farmers recorded their experiences on the outbreak of the virus like in the case of Mchinji fish ponds and hence helping to inform future interventions. Investors who operate without records are likely to make wrong decisions due to lack of information of what is happening in their farms. Fish farmers and hatchery operators are therefore required to keep accurate records for all of their farm operations.

Feeding Maize Bran at 100 MWK/kg at low stocking density

Here you see an example for a production of Tilapia at relatively low stocking densities of 3 fingerlings per m². The pond is well fertilized and the fish get maize bran as supplementary feed. The fish shall grow quickly. The fish shall eat as much maize bran as they want because maize bran is cheap. This leads to a very high food conversion ratio (FCR) up to 4.8 kg of maize bran per kg of fish at some stages of the production cycle. But since maize bran is sold at a rate of 100 MWK/kg the feed cost per kg of fish does not exceed 488 MWK/kg. Because of the low stocking density and the feeding of maize bran only, the total harvest reaches about 110 kg. It is not advisable to stock more fish, when feeding maize bran only, because at low stocking densities the natural feed in the pond contributes significantly to the growth of fish. If more fish have to share the natural feed, which supplemented with maize bran only, the fish growth will further reduce, and only more fish of smaller size will be harvested. This technique is “feed limited”.

Culture	Number of fish	Number of fish taken out (dead or alive)	average weight of the individual fish [g]	total weight of fish in the pond [kg]	kg of Feed used since stocking	FCR	feedcost [100 MKW/kg fish]
first day	600	0	5	3	0	n.a.	n.a.
after one month	600	15	15	9	7	0.8	78
after 3 month	585	10	25	14	49	3.5	350
after 6 month	575	5	90	51	249	4.8	488
after 9 month	570	0	193	110	494	4.5	449

Besides the feed cost also other cost are there. They sum up to about 790 MWK/kg fish. Total unit costs sum up to 1,245 MWK/kg.

The fish can be sold at a rate of 2.500 MWK/kg. The total weight of the fish in the pond at harvest is 110 kg. A **total profit of 137,950 MWK** can be achieved from a 200 m² pond.

The risk for diseases is low, because of the low stocking density and the provision of sufficient feed. Growth of the fish is medium, because maize bran is only a supplementary feed, which cannot express maximum growth rate of the fish, like well formulated extruded feeds.

Feeding well formulated floating Feeds at 800 MWK/kg at high stocking density

Here you see an example for a production of Tilapia at higher stocking densities of 6 fingerlings per m², while feeding extruded feeds (floating pellets). The pond is again well fertilized and additionally the fish get well formulated extruded feeds. The fish shall eat only as much extruded feed as they need to grow at optimum rate, because extruded feed is expensive. Feeding extruded feeds shall result in a fairly low FCR around 1.5, to avoid financial losses. FCR around 1 is optimistic and usually FCR around 1.2-1.5 can only be realized. Extruded feeds are sold at a rate of 800 MWK/kg and the corresponding feed cost per kg of fish increases up to 1,315 MWK/kg. To compensate for higher feed cost more fish can be stocked, because feed is not limiting factor for growth anymore. In the example more than twice as much kg can be harvested, compared to feeding maize bran.

Culture	Number of fish	Number of fish taken out (dead or alive)	average weight of the individual fish [g]	total weight of fish in the pond [kg]	kg of Feed used since stocking	FCR	feedcost [800 MKW/kg fish]
first day	1,200	0	5	6	0	n.a.	n.a.
after one month	1,200	15	20	23,7	41	1.7	1,383
after 3 month	1,185	10	40	47	81	1.7	1,378
after 6 month	1,175	5	120	140.4	235	1.7	1,339
after 9 month	1,170	0	230	269.1	442	1.6	1,314

The total unit costs per kg fish harvested is 1,715 MWK/kg. Fish can be sold at 2,500 MWK/kg. The total weight of the fish in the pond at harvest is 269.1 kg. **A total profit of 211,100 MWK** can be achieved from a 200 m² pond.

The growth of the fish is very good because of the excellent feed, supporting maximum growth. Still the total profit is comparable to the maize bran example, because of the high feed cost. The risk for diseases is higher, because of the stocking density is higher and at certain days oxygen might become limiting factor. If all fish die, because of oxygen depletion, or all fish are stolen, the loss is higher, because more money has been invested in feed and fingerlings. To manage higher risks following good aquacultural practices, strict monitoring and documentation, quick corrective action and sound technical knowledge is required.

Module 9 Exercise: Profit/loss calculation according to **fish feeding strategy**

		Maize bran	Well formulated Floating feed
Production (kg fish)		110	269.1
Money-out			
Feed	MWK	50,000	353,600
Fingerling	MWK	21,000	42,000
other inputs& services	MWK	28,550	28,550
Labour	MWK	37,500	37,500
Total money-out	MWK	137,050	461,650
Money-in			
Tilapia sales	MWK	275,000	672,750
Profit or loss (Money-in - Money-out)	MWK	137,950	211,100
Unit costs of feed per kg fish produced	MWK/kg fish	454.5	1,314.0
Total unit costs per produced fish (MWK/kg)	MWK/kg fish	1,245.9	1,715.5

MAIN LESSONS:

1. Continuous, strict monitoring of the pond and documentation of progress (fish weight, mortality, feed) is key to do good business in aquaculture.
2. The price, quantity and quality of the feed determines the fish growth and finally the profit of the aquacultural entrepreneur.
3. Calculations have shown that high cost feed (e.g. imported extruded fish feed) requires a lot of money-out. Money-in can be expected to be higher if pond is managed correctly. After evaluation of money-in and money-out, the profit is only slightly higher than with locally produced feed.
4. Risks are higher in the more intensive scenario (e.g. extruded fish) due to potential diseases coming from higher density, or other risk scenarios (theft, predators),
5. A good aquacultural entrepreneur evaluates the expected costs and profit and takes an informed decision on feeding strategy before starting the culture
6. Changing feeding technique requires changes in the pond management techniques.
7. To manage risks, following good aquacultural practices, strict monitoring and documentation, quick corrective action and sound technical knowledge is required.

Get up-to-date information from your extension worker on the recommended techniques !

Main lessons

1. Investing in fish production are investments for a long period. The good agricultural entrepreneur (man or woman) searches and follows technical and financial recommendations to plan and to succeed this investment.
2. The investment calendar for fish production shows the Money-Out and the Money-In for 15 years.
3. The Total Money out in year 1 show the capital (savings and / or loans) needed to start the investment.
4. The annual cash flow balance shows for each year whether there is a surplus (Money-In bigger than Money-Out) or a deficit (Money-In smaller than Money-Out).
5. The cumulative balance (bottom line) of the investment calendar shows at what year the agricultural entrepreneur has recovered the money invested at the beginning by money from sales. The good agricultural entrepreneur (man or woman) recognizes this by the figures of the bottom line that have no longer a small dash “-“ in front.
6. The investment calendar is useful to prepare the financing of investments by savings or partially by credit.
7. If the agricultural entrepreneur (man or woman) takes a loan, he/she takes into account the interest to be paid. Loan officers will help him /her to complete the calculations and to make the decisions.

Module 10 Benefits from membership of Farmers' Organisations

Questions for discussion in this module

- How a Farmer Organisation can support you in your business development
- How a Farmer Organisation can support you with access to inputs and markets
- What the economic benefits are of belonging to a Farmer Organisation
- How one can know if a Farmer Organization works well

How can one know if a Farmers' Organisation works well?

Existence of the group:

- Members pay membership fees and annual contributions without pressure.
- Members understand cost deductions on groups sales and accept them without complaining.

Operation of the group:










- Existence of rules
- Existence of rules on the control of accounts
- Regular production and presentation of reports
- The evolution of group activities (tonnage production, sales volumes of expenditure, group purchasing of inputs) is positive.

Exercise 1: Group purchase of inputs

Group purchase of inputs can help to negotiate lower prices as larger quantities are bought. **As an example, we assume that inputs can be purchased at a 10% discount through purchases as a group.**

Let us see how much the benefit is for one group member if all required inputs (seed, herbicide, fertiliser, pesticides, bags, etc.) are purchased as a group at a lower price. Services such as land preparation, transport from field to house and to market is not to be included.

Calculation of benefit from group purchase of inputs – improved production techniques










		Tilapia improved		Soybean improved		Maize improved	
							
	Unit	Individual input purchase 	Group input purchase (less 10%) 	Individual input purchase 	Group input purchase (less 10%) 	Individual input purchase 	Group input purchase (less 10%) 
Surface Area	Ha	1	1	1	1	1	1
Cost of Inputs (i.e. without services)	MWK	459,500	- 413,550	171,200	- 154,080	280,700	- 252,630
Benefit Group Purchase	MWK	=		=		=	

Total Benefit from the Group Purchases MWK

Exercise 2: Group sale of products

Selling products as a group can also be called **collective marketing**.

Let us calculate the economic benefit obtained through group sales with better prices – in the case of improved farm production, looking at maize, soybean and tilapia

		Tilapia Improved 		Soybean improved 		Groundnut improved 	
	Unit	Individual Sale 	Group Sale 	Individual Sale 	Group Sale 	Individual Sale 	Group Sale 
Surface Area	Ha	1	1	1	1	1	1
1. Money-Out (Inputs & Services, Labour)	MWK						
Production	Kg	550	550	2,400	2,400	3,900	1,800
Price	MWK/kg	2,500	2,750	500	550	550	570
2. Money-In Production	MWK	1,375,000		1,200,000		990,000	
3. Benefit from Group Sales	MWK						
Total Benefit from the Group Sale				MWK			

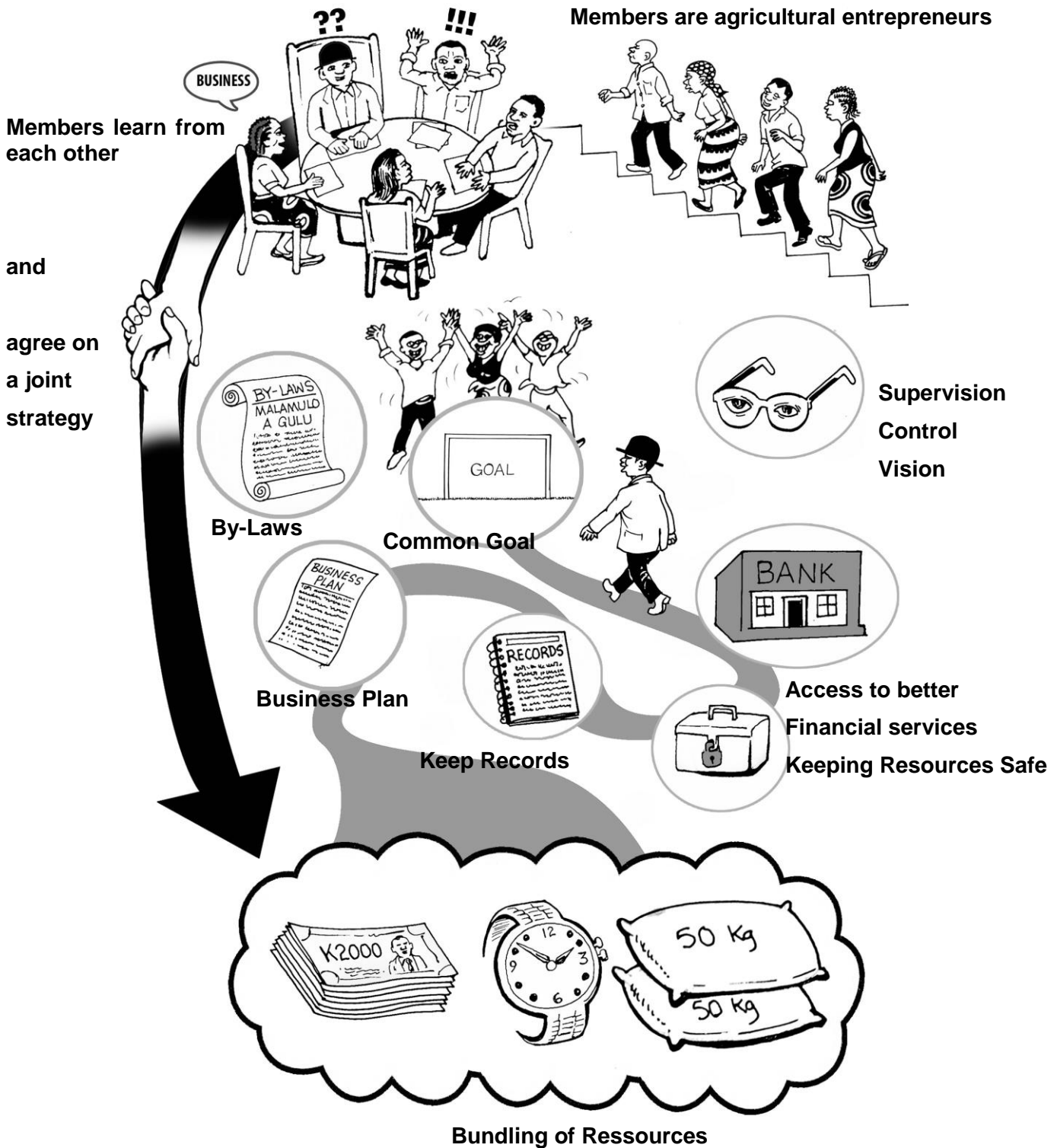
Agricultural entrepreneurs can also benefit through group transport after harvest aggregation.



What is a good Farmer Organization?

- How can you know if your farmer organisation works well?
- What are characteristics of a successful farmer organization?
- How can you contribute to the success of your farmer organization?

Let us discuss the following picture. What do you see?



Main Lessons

1. Agricultural entrepreneurs form groups or associations to do things they are not able to do alone. Farmer organisations can thereby help agricultural entrepreneurs to address challenges, overcome risks and seize business opportunities.
2. Groups or associations of agricultural entrepreneurs have a common business objective. To achieve their common objective, the members plan together, learn from each other and support each other. Group activities such as group sales of products need to be carefully planned and well managed.
3. Larger business partners that sometimes offer interesting opportunities often prefer to work with groups or associations to avoid risk and save on cost.
4. Good Farmer Organisations offer relevant and good services to members. Economic benefits of belonging to a Farmer Organisations can include:
 - a. better exchange between farmers to learn from each other
 - b. better access to information about markets and prices,
 - c. better access to good inputs such as seed,
 - d. reduced costs of buying inputs
 - e. better access to knowledge about production,
 - f. access to equipment and machines such as scales or milling machines
 - g. better access to good or new markets,
 - h. more negotiating power with sellers of inputs and buyers of commodity
 - i. reduced costs of marketing
5. Group activities need to be very well planned and organized in order for members to benefit. Moreover, the leaders have to carefully calculate if there is a tangible profit for members from the specific group activity and service. When leaders have done their job properly they can convince members with good and correct arguments.
6. In a good farmer organisation:
 - a. Members are agricultural entrepreneurs
 - b. Leaders and members share a joint vision and clear business objectives
 - c. Farmer Organizations offer relevant and good services to members
 - d. There are clear rules about important aspects of the organisation (e.g. through By-Laws). The rules are applied. If rules are not adhered to there are clearly defined and applied sanctions (e.g. payment of fees)
 - e. Records are kept in a professional way. This is important to assess performance of the Farmer Organization and increases transparency and member trust. Accounts are controlled and leadership produces reports regularly.
 - f. Members, who want their Farmer Organization to be strong pay their financial contributions, participate actively in meetings, participate in group economic activities and ask leaders to be accountable. Resources are necessary for the farmer organization to function properly.
 - g. Members select leaders for their capacity and commitment to lead the Farmer Organization to success. Leaders are strategic, competent, transparent and accountable. Competent women and youth have the same chances to become leaders as competent men.
 - h. Group business activities increase over time. A successful organisation starts small and develops further over time.
7. Agricultural entrepreneurs that are members of well-functioning associations or groups do better business.

Module 11 Earning more money: Investing in fish

We have seen that you can make money with fish through good planning and market knowledge, good aquaculture techniques, data and calculations that help you to make good decisions.

For pond-based aquaculture, investment in the pond and equipment is needed.

Let's see what the investment is about.

The investment calendar on the following two pages shows us the Money-Out and Money-In each year and whether the investment is good business.

Investment calendar for improved pond-based fish production (Year 1- Year 10)

1. Money-Out													
<i>Inputs and services</i>	Unit	Quantity	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fingerlings [F/m ²]	by piece	600	35	21.000	21.000	21.000	21.000	21.000	21.000	21.000	21.000	21.000	21.000
organic Fertiliser	bag of 100kg	10	2000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
chemical fertilizer	bag of 50 kg	0	35000	0	0	0	0	0	0	0	0	0	0
Lime/Dolomite	bag of 50 kg	0	12000	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400
Maize Bran feed	20 kg bag	25	2000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000
Transportation of feed & fingerlings	lumpsum	2	3000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
Packing of fingerlings	by bag	1	150	150	150	150	150	150	150	150	150	150	150
Subtotal Inputs and Services	MWK			99.550	99.550	99.550	99.550	99.550	99.550	99.550	99.550	99.550	99.550
<i>Labour</i>	Unit	Quantity	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Pond preparation	MD	3	1500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500
Slushing of dikes	MD	3	1500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.500
Fertilising	MD	0,5	1500	750	750	750	750	750	750	750	750	750	750
stocking of fingerlings	MD	0,5	1500	750	750	750	750	750	750	750	750	750	750
Feeding	MD	10	1500	15.000	15.000	15.000	15.000	15.000	15.000	15.000	15.000	15.000	15.000
Checking & Weighing & Observing	MD	6	1500	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000
Harvesting	MD	0,5	1500	750	750	750	750	750	750	750	750	750	750
Marketing & sales	MD	0,5	1500	750	750	750	750	750	750	750	750	750	750
Transport	MD	1	1500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
Subtotal labour	MWK			37.500	37.500	37.500	37.500	37.500	37.500	37.500	37.500	37.500	37.500
<i>Pond and equipment</i>	Unit	Quantity	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Pond repair(dike reshaping) (every 5 years)	lumpsum	1	35.000						35.000				
Tools & equipments (net, scale, scoop net , slasher, shovel, pipes) (every 5 years)	lumpsum	1	20.000	20.000					20.000				
Construction of pond (period of use 15 years)	lumpsum	1	300.000	300.000									
Subtotal Equipment	MWK			320.000	0	0	0	0	55.000	0	0	0	0
Total Outflows	MWK			457.050	137.050	137.050	137.050	137.050	192.050	137.050	137.050	137.050	137.050
2. Money-In													
<i>Products</i>	Unit	Quantity	Unit price	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fish	kg live weight	110	2500	275.000	275.000	275.000	275.000	275.000	275.000	275.000	275.000	275.000	275.000
Crops	kg	0	0	0	0	0	0	0	0	0	0	0	0
Total inflows in	MWK			275.000	275.000	275.000	275.000	275.000	275.000	275.000	275.000	275.000	275.000
3. Profit or Loss													
Annual Cash flow balance	MWK			-182.050	137.950	137.950	137.950	137.950	82.950	137.950	137.950	137.950	137.950
Cumulative Balance	MWK			-182.050	-44.100	93.850	231.800	369.750	452.700	590.650	728.600	866.550	1.004.500

Main lessons

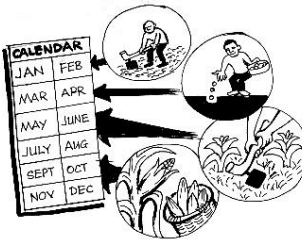
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Module 12 Becoming an aquacultural entrepreneur

The templates has been presented to you in this session.

- What have you learnt?
- What will you change?
- What do you need to succeed and do good business?

What I like to improve or start to do



Planning (using the agricultural calendar)



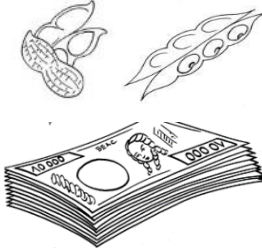
Using good quality seed




Using good quality inputs and applying these on time



Keeping records of all activities (labour, inputs and services) using the FBS workbook



Producing and delivering good quality soya, groundnut (clean, dry...)



Calculating the profit (gross margin)



Opening a bank savings account



Establishing an interest group / producer organisation






Others (specify)













Ask for your ABS participation certificate with serial number and signature of your trainer



Use the templates in Part 2 of this workbook to do the following:

-  **Plan production**
-  **Record Money-Out and Money-In**
-  **Calculate whether you made a profit or a loss**
-  **Plan expenditure and income from sales**
-  **Control the reimbursement of loans**

2. Templates for application Management Calendar for Pond 1

Plan and evaluate production Tasks of the entrepreneur 		September	October	November	December	January	February	March	April	May	June	July	August
	Pond site selection												
	Pond preparation												
	Purchase of inputs (maize bran)												
	Slushing of dykes												
	Applying organic fertiliser												
	Stocking of fish												
	Feeding												
	Checking, weighing and observing												
	Harvesting												
	Transport												
	Marketing & sales												

Evaluation production of fish _____

Profit or Loss – Fish

Pond size : _____

Pond location: _____

		Expected before production			Evaluation after sales		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money-Out							
Inputs							
Total cost of Inputs							
Labour – Man-days (MD)							
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
Total Labour needs and costs							
Total Money-Out Costs of Inputs + Cost of Labour			MWK				
2. Money-In Production X Sales Price			MWK				
3. Profit or Loss? Money-In MINUS Money-Out			MWK				
4. Unit Cost (MWK/kg) Money-Out / Production			MWK/kg				

Tracking Money-Out for Fish – Pond 1













Date	Reason	Amount Money-Out
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
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		MWK
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		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
Total		MWK

Tracking Money-In for Fish – Pond 1



Date	Reason	Amount Money-In
		MWK
		MWK
		MWK
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		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
Total		MWK

Management Calendar for Pond 2

Plan and evaluate production Tasks of the entrepreneur 		September	October	November	December	January	February	March	April	May	June	July	August
	Pond site selection												
	Pond preparation												
	Purchase of inputs (maize bran)												
	Slushing of dykes												
	Applying organic fertiliser												
	Stocking of fish												
	Feeding												
	Checking, weighing and observing												
	Harvesting												
	Transport												
	Marketing & sales												

Evaluation production of fish _____

Profit or Loss – Fish

Pond size : _____

Pond location: _____

		Expected before production			Evaluation after sales		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money-Out							
Inputs							
Total cost of Inputs							
Labour – Man-days (MD)							
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
Total Labour needs and costs							
Total Money-Out Costs of Inputs + Cost of Labour			MWK				
2. Money-In Production X Sales Price			MWK				
3. Profit or Loss? Money-In MINUS Money-Out			MWK				
4. Unit Cost (MWK/kg) Money-Out / Production			MWK/kg				

Tracking Money-Out for Fish – Pond 2



Date	Reason	Amount Money-Out
		MWK
		MWK
		MWK
		MWK
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		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
Total		MWK

Tracking Money-In for Fish – Pond 2



Date	Reason	Amount Money-In
		MWK
		MWK
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		MWK
		MWK
		MWK
		MWK
Total		MWK

PLOT 1

Cropping Calendar for Plot 1

Size of Plot (field)	Main Crop	Variety
	Associated mixed crop 1	Associated mixed crop 2

Work Planned	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec

Profit or Loss – Plot 1

Plot area : _____ Unit		Expected before production			Evaluation after harvest		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money-Out							
Inputs							
Total cost of Inputs							
Labour – Man-days (MD)							
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
Total Labour needs and costs							
Total Money-Out Costs of Inputs + Cost of Labour			MWK				
2. Money-In Production X Sales Price			MWK				
3. Profit or Loss? Money-In MINUS Money-Out			MWK				
4. Unit Cost (MWK/kg) Money-Out / Production			MWK/kg				

Tracking Money-Out for Plot 1

Date	Reason	Amount Money-Out
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
Total		MWK

Profit or Loss – Plot 2

Plot area : _____	Unit	Expected before production			Evaluation after harvest		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money-Out							
Inputs							
Total cost of Inputs							
Labour – Man-days (MD)							
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
Total Labour needs and costs		MD					
Total Money-Out Costs of Inputs + Cost of Labour			MWK				
2. Money-In Production X Sales Price			MWK				
3. Profit or Loss? Money-In MINUS Money-Out			MWK				
4. Unit Cost (MWK/kg) Money-Out / Production			MWK/kg				

Tracking Money-Out for Plot 2

Date	Reason	Amount Money-Out
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
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		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
		MWK
Total		MWK

Profit or Loss – Plot 3

Plot area : _____ Unit		Expected before production			Evaluation after harvest		
		Quantity	Price (MWK)	Total (MWK)	Quantity	Price (MWK)	Total (MWK)
1. Money-Out							
Inputs							
Total cost of Inputs							
Labour – Man-days (WD)							
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
	MD						
Total Labour needs and costs		MD					
Total Money-Out Costs of Inputs + Cost of Labour			MWK				
2. Money-In Production X Sales Price			MWK				
3. Profit or Loss? Money-In MINUS Money-Out			MWK				
4. Unit Cost (MWK/kg) Money-Out / Production			MWK/kg				

Evaluate the production year

Fish	Pond number	Fish species - Main	Number of animals	Money-Out (MWK)	Quantity produced (kg)	Unit	Sales Price per Unit (MWK)	Money-In (MWK)	Profit or Loss 😊 or 😞
	1	Tilapia							
	2								
	3								
	4								
	5								
Plots	Plot Number	Main Product	Area	Money-Out (MWK)	Quantity produced (kg)	Unit	Sales Price per Unit (MWK)	Money-In (MWK)	Profit or Loss 😊 or 😞
	1								
	2								
	3								
Total									

	Fish Pond 1	Fish Pond 2	Plot 1	Plot 2	Plot 3
Am I satisfied with the results of the year?					
What is the most important change to make for the next year?					
What is the purpose of this change?					
How will I make this change? How much will it cost?					
How much money can I raise?					
Do I need credit?					

Manage money throughout the year

Planning of household expenditure

Financial Needs	Expenditures (MWK)	When
Matches		Monthly
Salt		Monthly
Soap		Monthly
Petrol		Monthly
Food		Monthly
Water		Monthly
Mobile phone		Monthly
Sub-total		Monthly
School fees		Twice per year
Clothing		Twice per year
Financial Needs	Expenditures (MWK)	When
Happy Events		
Christmas		December
Easter		March/April
Reserves for unforeseen expenditures		Monthly

My Financial Calendar for Planning

Money-Out

Product		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Inputs												
	Labour												
	Inputs												
	Labour												
	Inputs												
	Labour												
	Inputs												
	Labour												
	Inputs												
	Labour												
	Inputs												
	Labour												
Equipment and tools													
Household													
School fees													
Happy events													
Clothing													
Total Money-Out per month													

My Financial Calendar for Planning

Money-In

Product	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Other revenues												
Total Money-In per month												
Monthly balance Money-In minus Money-Out												
Cumulative Balance												

Manage loan and reimbursement

Purpose of loan		
Interest rate		
Date of loan		
Final reimbursement date		
Amount received	MWK	
Amount to reimburse	MWK	
Date	Amount reimbursed	Remaining reimbursement
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK
	MWK	MWK

The partners

Ministry of Trade and Department of Fisheries under Ministry of Natural Resources and Climate Change implements its mission “To ensure increased and sustainable fish production and utilization by properly managing and promoting aquaculture and reducing post-harvest losses. With a vision to “become a leader of competitive, inclusive and sustainably produced farmed products in the SADC that contributes significantly towards wealth creation, employment, food and nutrition security, agricultural transformation and self-reliance in Malawi. A recognized leading contributor to food and nutrition security, equitable access to agriculture, water and forestry resources and enhanced livelihoods”. And a mandate “To promote, manage and utilize the agriculture, water and forestry resources sustainably”. ABS is being supported in this framework.

The GIZ programme Aquaculture Value Chain for Higher Income and Food Security in Malawi (AVCP) is implementing the ABS in Malawi, in collaboration with the Department of Fisheries of the Ministry of Agriculture and other stakeholders in the framework of German-Malawi Development Cooperation. GIZ implements both programmes with the following objectives:

Transition from, ‘agriculture as a destiny’ to, ‘agriculture as a business’ (subsistence - commercial)

Sustainable and profitable use of land resources and enhanced livelihoods in the communal areas

To this effect, interventions are implemented to promote agriculture as a business and producer organization to enhance production, market access and marketing of agricultural produce

Implementing partners in Malawi:

Department of Fisheries of the Ministry of Forestry and Natural Resources, IFFNT...

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