MINISTRY OF FOOD AND AGRICULTURE
DIRECTORATE OF AGRICULTURAL EXTENSION SERVICES

HANDBOOK ON AGRICULTURE VALUE CHAIN ANALYSIS & MANAGEMENT

MODULE 3

April, 2013

OA&A

Manual on Value Chain Analysis and Management

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FACT SHEET 1

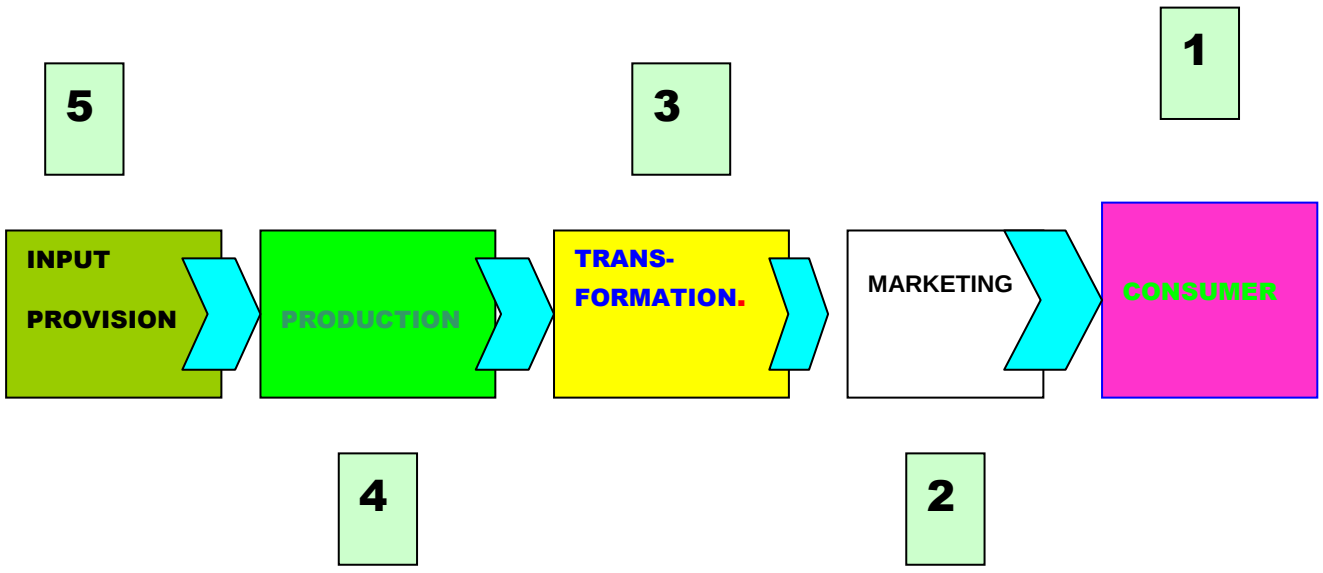
Value Chain Finance Analysis and Management

Topic 1: What is Agricultural Value Chain (AVC)?

Objectives: To explain the concepts of AVC and AVCF
To understand the benefits of the AVCF
i) key principles underlying AVCF, ii) Analytical tools used, iii) Step-by Step analysis, iv) criteria for selecting bankable investments and creditworthy customers for a bank.

Definition: An agricultural value chain covers (encompasses) the full range of activities and services required to bring a product or service from its beginning (conception) to its end use. It involves the order in which (sequence) productive (i.e. value added) activities take place starting from farm producers to final consumers. Hence, the term, "From Farm to Fork"

Figure 1: In the Value Chain, the Consumer is first



Source: OA&A Associates

Who are the key actors along a typical AVC? They include: i) Input dealers/suppliers, ii) producers who may be groups, Farmer based organizations (FBOs) and cooperatives, iii) Technical Operators (TOs) who are off-takers including aggregators, processors, exporters, bulk-buyers, iv) Marketers (Wholesalers and Retailers), v) Transporters, and vi) End-users/consumers of the product or service including individuals, households, institutions, etc. Quite unlike the supply chain, the consumer is prioritised in the value chain (See **Error! Reference source not found.**).

Is there informal lending between actors in a typical VC?

Between the key actors along many VCs, there may be on-going financing and lending between themselves. It would be observed that farmer groups may be financed by processors to ensure supply of raw materials to the latter. Typical examples include financing of say tomato and maize farmers by market queens for their produce. However, all such financing are *informal* and not by financial institutions.

MOFA and the Value Chain

In discussing the value chain within the context of MOFA, it is necessary to take a glimpse at some facts about MOFA, its mandate, vision, mission and objectives and to reflect on the extent to which the value chain plays out in these statements and what MOFA Extension agents do on the field.

1. **Facts about Agriculture in Ghana**

- Agriculture is the back bone of Ghana's economy and the key driver of growth
- It contributes 38% of GDP, employs 45% of the active population, engages 60% of rural labor force, accounts for 75% of export earnings, and contributes 90% of food needs
- Yet more than 90% of farm holdings average 2 ha in size, are subsistent in nature, and dominated by women and vulnerable groups
- The sector has a greater impact on poverty reduction than other sectors and is critical for rural development, social stabilization, environmental sustainability and economic resilience

2. **Mandate of MOFA**

- MOFA is the lead agency and focal point of the Government of Ghana responsible for developing and executing policies and strategies for the agriculture sector within the context of a coordinated national socio-economic growth and development agenda
- By means of a sector-wide approach, the MOFA's plans and programmes are developed, coordinated and implemented through policies and strategic frameworks
- The current policies and strategic frameworks are
    - the Food and Agriculture Sector Development Policy (FASDEP II) and
    - the Medium Term Agriculture Sector Investment Plan (METASIP 2010-15).

3. **Vision and Mission of MOFA**

The vision of MOFA is

"***a modernised agriculture culminating in a structurally transformed economy and evident in food security, employment opportunities and reduced poverty***"

The mission of MOFA is

"***to promote sustainable agriculture and thriving agribusiness through research and technology development, effective extension and other support services to farmers, processors and traders for improved livelihood***"

4. Objectives of MOFA

Agriculture in Ghana is recognized as the mainstay of the economy with a greater impact on poverty reduction than other sectors. It is also critical for rural development and associated cultural values, social stabilization, environmental sustainability and buffer during economic shocks. Based on the role of agriculture in the national development framework, Food and Agriculture Sector Development Policy (FASDEP II) has the following as its objectives:

- Food security and emergency preparedness
- Improved growth in incomes
- Increased competitiveness and enhanced integration into domestic and international markets
- Sustainable management of land and environment
- Science and Technology Applied in food and agriculture development
- Improved Institutional Coordination

5. The strategy of MOFA

Ghana's agricultural strategy synthesizes the government's policy framework and action plans for attaining self-sustained growth in all agricultural sub-sectors by annualizing the Medium Term Agricultural Sector Development Plan (METASIP 2010-2015), thus providing the vehicle for optimizing agriculture and integrated rural development for the structural transformation for the socio-economic development of Ghana.

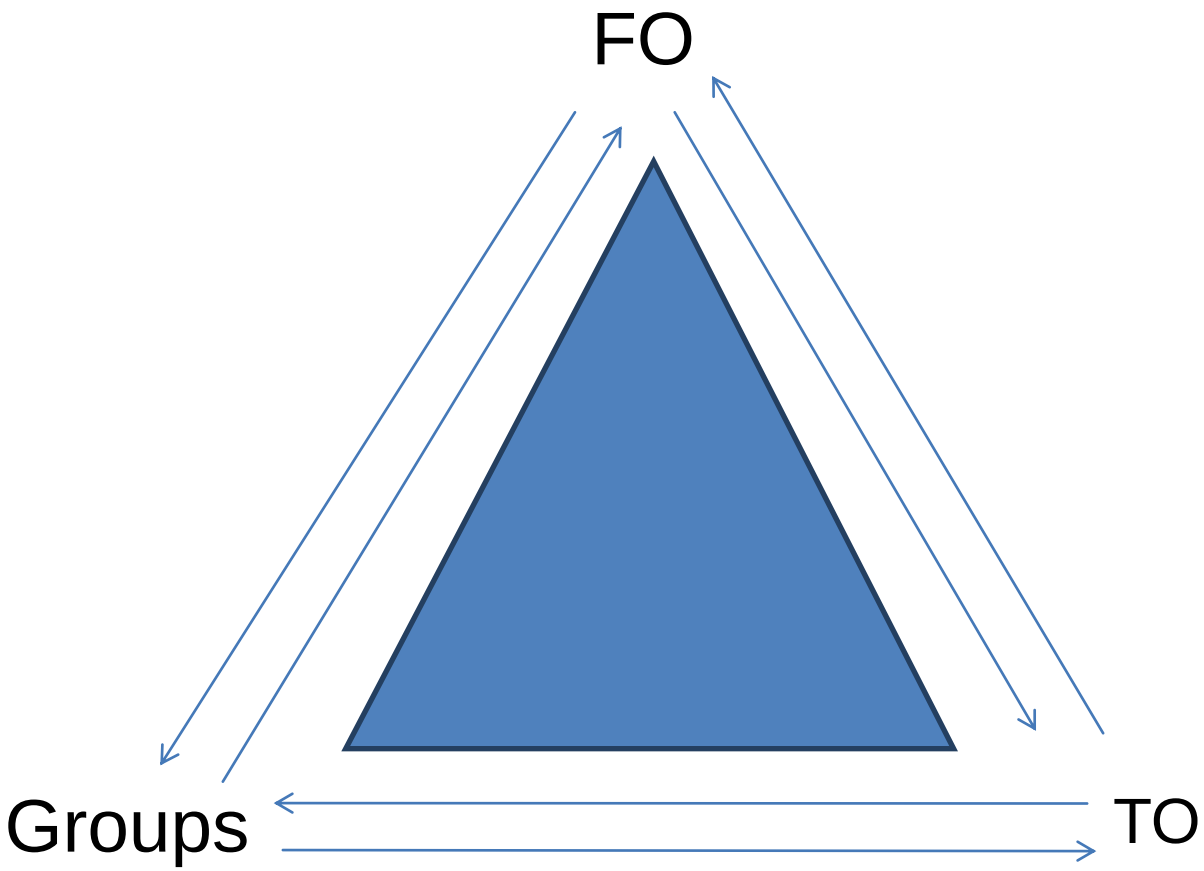
The Agricultural sector consists of five main subsectors:

- Crops: Cereals and Starchy Crops
- Livestock: Cattle, Sheep, Goats, Pigs, Poultry
- Fisheries: Marine, Inland and Aquaculture
- Forestry
- Cocoa
  *However, Ghana Cocoa Board under the Ministry of Finance & Economic Planning (MOFEP) is responsible for cocoa affairs in the country.
  *The Ministry of Lands & Mineral Resources has responsibility for the Forestry Commission.

What is Agricultural Value Chain Financing (AVCF)?

AVCF arises when a set of actors along the value chain (VC) such as a Technical Operator (TO) and Out-grower Groups are financed by a financial institution also called Financial Operator (FO) through a contractual arrangement as in **Figure 2**.

Figure 2: Key Operators in a Tripartite Relationship



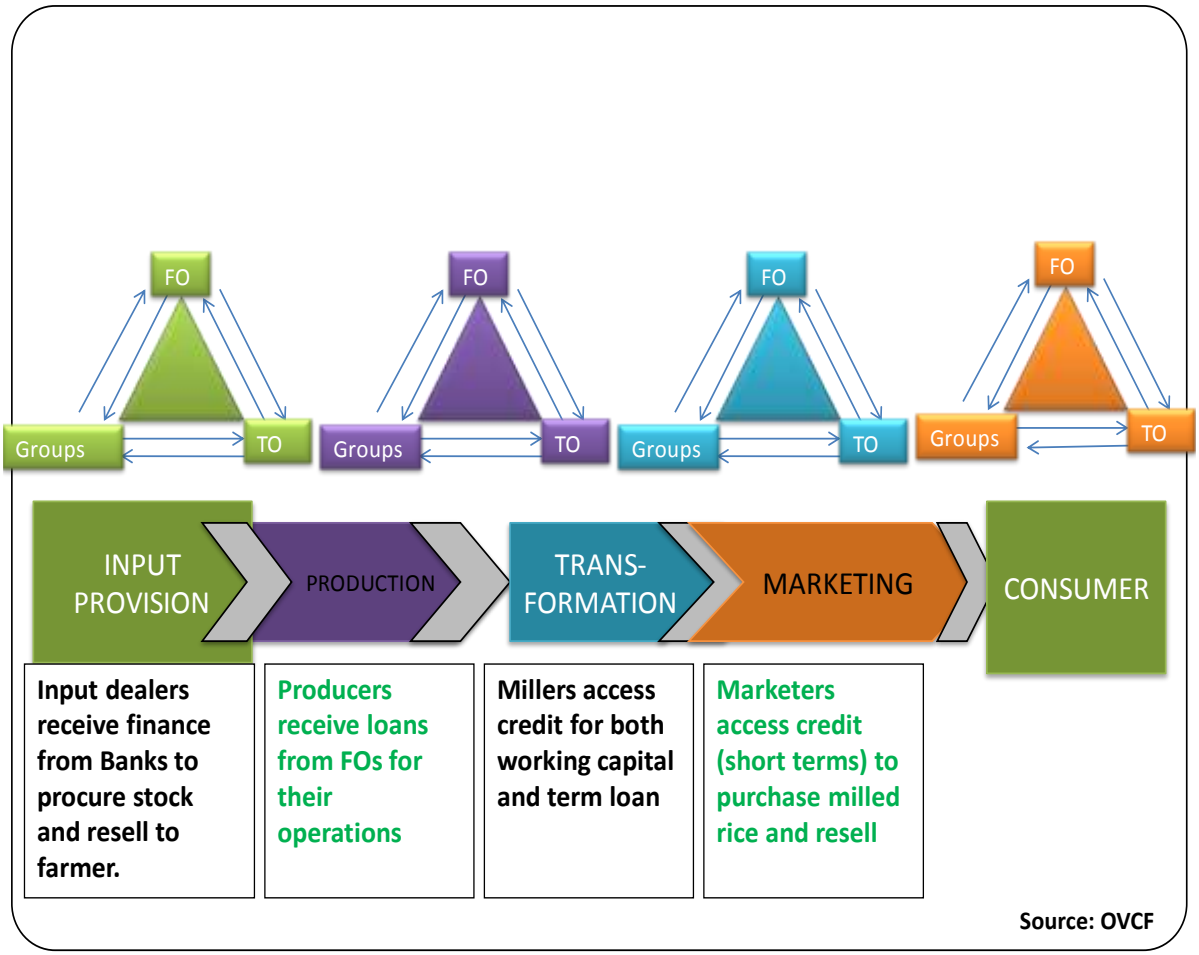
Source: Out-grower and Value Chain Fund (OVCF)

Who are the key Financial Operators?

In Ghana, examples of financial operators in value chain financing schemes include the following:

i) Universal Banks (e.g. commercial banks, development banks),
ii) Rural Banks,
iii) Non-Bank Financial Institutions (e.g. savings and loans companies (S&LCOs), finance companies)
iv) Financial Non-Governmental Organisations (FNGOs).

Figure 3: Demonstration of Products along the Value Chain



Why the need for AVCF?

- AVCF is coherent with the objective of providing financial services to more entrepreneurial rural clients/farmers involved in profitable value chains, in linkage with agro processing / export firms or other mechanisms for more effective access to markets.

- AVCF yields higher repayment rates/lower Portfolio at Risk (PAR) than discrete lending to groups or individuals and off-takers.

  Reasons for higher repayment rates include:

  i) technology and inputs required by the group to enhance productivity are provided by the TO as part of its responsibilities in the contract farming arrangement,

  ii) Guarantee access to market at remunerative prices for the produce from the groups at pre-negotiated prices before the cropping seasons start.

- Higher loan amounts are permitted under AVCF than discrete lending to say groups alone or off-takers alone. In AVCF, disbursements are targeted on timely basis to

meet investments and recurrent/working capital required to deliver end products of the various chains.

The combined effect of bullet 2 & 3 is enhanced bottom-line/profitability for the lender.

- Emphasis is on group lending instead of individuals in AVCF. This helps to reduce operational transaction costs whilst the groups themselves serve as joint liability security for their loans through group/peer pressure exerted on individuals within the groups.
- AVCF helps to diversify the income sources of the lender and thereby spreads its risk in lending.

Other reasons for AVCF:

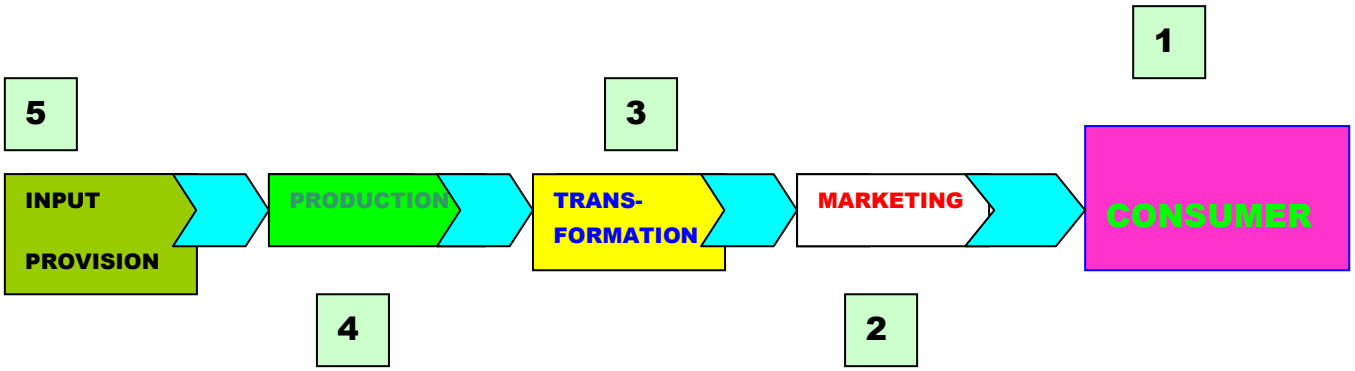
- Increases outputs from the selected VCs with a view to boosting the agricultural gross domestic product (AgGDP) of the country.
- Improves incomes through self-employment of actors along the VCs as well as generating jobs for others in the various value-added services and activities. Therefore, AVCF is a very useful tool for reducing rural poverty.
- Increases foreign exchange generation where exportable activities (e.g. rubber products) are financed while for import substitution activities (e.g. rice), foreign exchange will be saved.

ADDITIONAL INFORMATION
Value chain Financing and Management

Recap from Topic 1: AVCF ensues only when a financial institution lends to a set of actors linked by a contract.

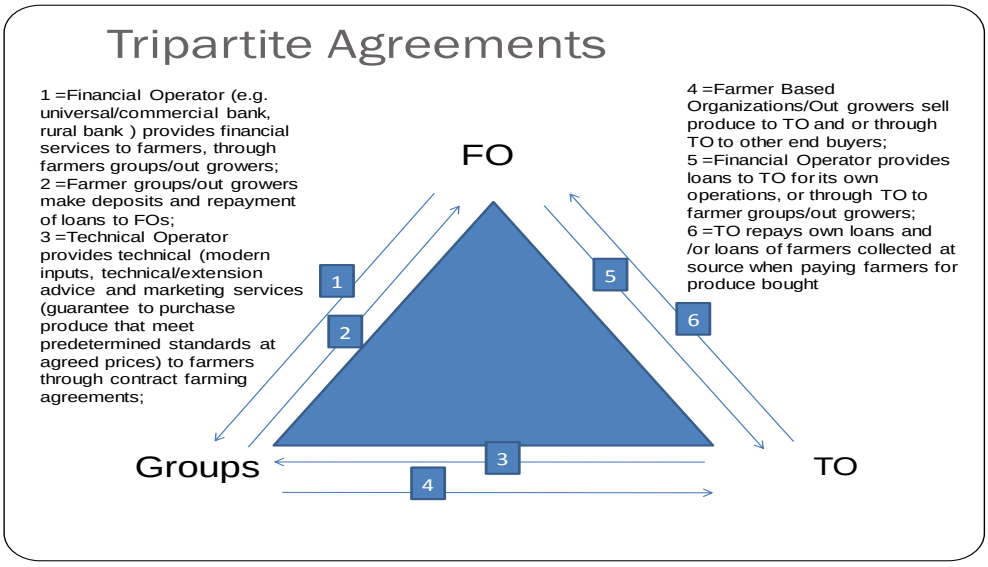
Therefore, when **Figure 2** is superimposed on a section of two actors along the Value Chain as in **Error! Reference source not found.**, AVCF results as in **Figure 3**, depicting various loan products. See **Figure 4**, **Figure 5** and **Figure 4** for further details.

Figure 4: Generic Flow Chart for Value Chain Analysis (revisited)



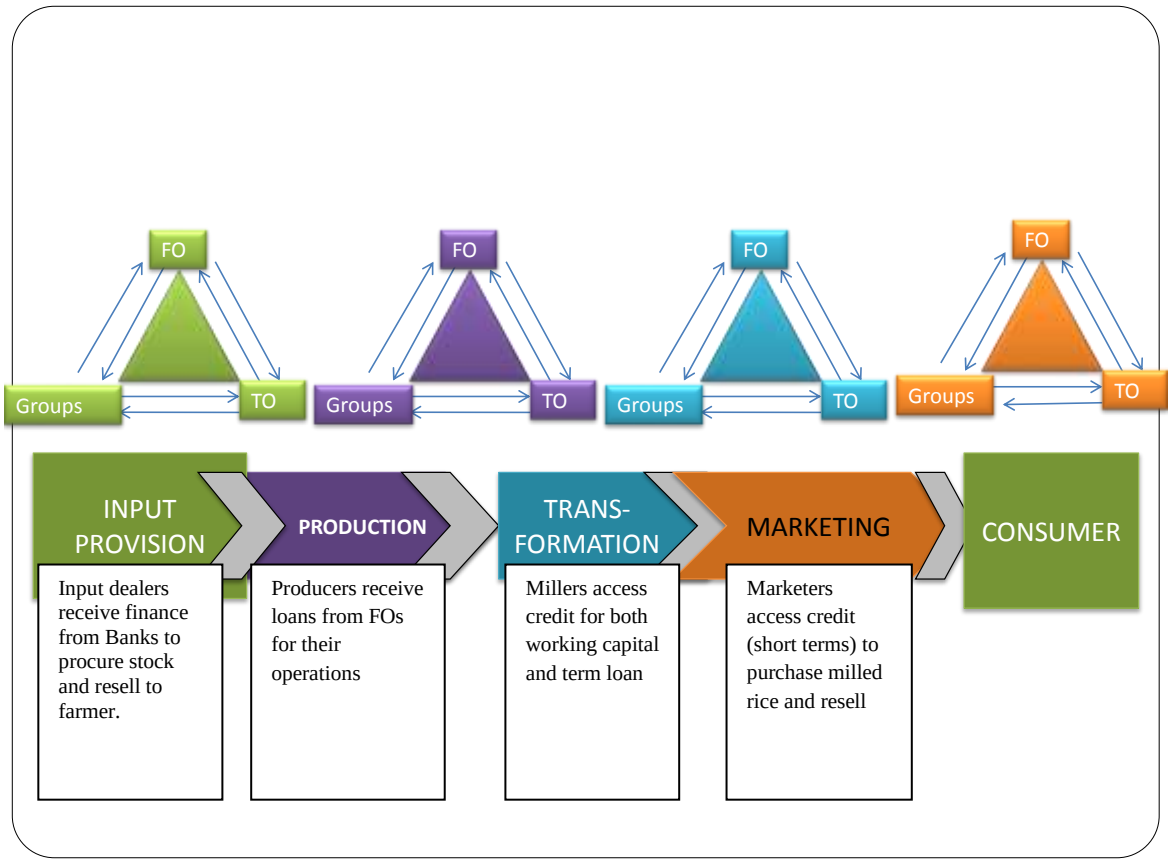
Source: OA&A

Figure 5: Further Details on the Tripartite Agreements and Relationships



Source: Out-grower and Value Chain Fund (OVCF)

Figure 6: Superimposition of the Tripartite Relationships along the value chain



Source: OVCF

FACT SHEET 2

Value Chain Finance Analysis and Management

Topic 2: Key principles underlying AVCF, key analytical tools

Objectives:
To understand the key principles underlying AVCF.
To understand the Analytical tools used in AVCF.

What are the key principles underlying AVCF and why?

The key principles of AVCF include the following:

a) There should be **profitable** and **sustainable** Market
b) Profit should be made by every Actor and Service Provider along the Chain
c) The **size** and **length** of the chain with formal relations between Actors is important because longer chains give rise to:
    - Higher job creation
    - Larger Agricultural GDP
    - Ultimate Growth and Development of the Country
d) There should be linkages between smallholder producers and other Actors in the Chain. The main linkages are:
    - Outgrower schemes relationships are established between smallholder farmers and Technical Operator (TO)
    - Smallholder producers are provided with Technical Support by the Technical Operator (TO)
    - Contract Farming agreements are made between Smallholders and the TO

Reasons for the underlying principles:

a) The existence of profitable and sustainable market is key for successful VCF- Emphasis is therefore placed on markets to drive production rather than the other way round.

    Note that in any value chain, the actors also serve as markets to each other. For example, the producers serve as markets for input dealers, the processors serving as markets for the producers, the marketers serving as markets for the processors and the end-consumers serving as markets for the marketers. Note also the various actors serve as markets for financial institutions and transporters when respectively they provide them with financial and transport services. Thus, when farming is considered as agribusiness, the actors provide services to each other and markets to themselves, whilst the final consumer of the service or product is the ultimate.

Rule of Thumb: In this world, for each service provided there is always an end-user of the service, and vice versa. We are all therefore services providers and end-users of services provided by others.

b) Every actor along the VC and also service providers (e.g. financial institutions, transporters) to actors along the chain should realize profit from investments undertaken and services being provided. Every actor or service provider whose investment or service is not profitable becomes the weakest link in the chain and may lead to a break in the chain. This is why *A 'Win-Win'* case is always advocated in AVCF.

c) Size of the value chain with more or less formal relations between actors, export or domestic markets should be encouraged and promoted. It is generally assumed that the longer the chain, the better for value addition, and consequently higher jobs creation, leading to a larger agricultural gross domestic product (AgGDP) which ultimately translates into growth and development for the country. This is why AVCs are important for the development of any country.

d) Regarding the linkage between smallholder producers and other actors of the chains, the more formal and supposedly accomplished case is when a company (acting as Technical Operator (TO)/ off-taker) is developing an out-grower scheme through contract farming, providing technical support to farmers and securing a profitable and sustainable market. See the Topic on Contract Farming under the module 'What is Agribusiness'?

What are the key analytical tools used in AVCF and how?

Two (2) main analytical tools are applied in AVCF methodology: These are:

i) A Flowchart Analysis, and
ii) Triangular Analysis.

Uses of Generic Flow Chart: The flow chart is used to:

- Emphasize markets as critical to successful AVCF.

- Segment the Value Chain into different stakeholders involved along the chains, e.g. a) input suppliers, b) farmers/producer groups, c) processors/exporters/bulk buyers, d) marketers/wholesalers/retailers/traders; and finally e) consumers/end-users of the products; and examine the relationship between them.

- Design financial (loans, savings, insurance) products for various actors along the chains; and

- Calculate value addition from one actor to another along the chain.

Note, the summation (∑) of the value additions along any chain constitutes the agricultural gross domestic product.

Uses of Triangular Tool:

- Elucidate the roles of various actors and the possible relationships that can be forged between parties;

- Secure markets through linkages in tripartite arrangements between FO as lender, TO (processor, exporter, broker, aggregator, etc) and producer groups; and

- Facilitate/forge contractual relationships, e.g. contract farming between TO and producer groups.

FACT SHEET 3

Value Chain Analysis and Management

Topic 3: Step-by-step analysis in AVCF and An Example of the Financial Analysis of a Maize Producer

Objectives:

Understand Step-by Step analysis in AVCF, and criteria for selecting bankable investments and creditworthy customers for a bank.

Understand the credit appraisal process normally adopted by Banks and other Financial Institutions when they receive loan applications from farmers.

To explain how the principles of Value Chain Financing is practically undertaken.

The following financial analysis is for maize as a value chain crop. This financial analysis example is intended to be a guide to:

- Farmers as a Business Planning Tool and as a tool for accessing Loans
- Extension Officers in their capacity as facilitators to Farmers seeking loans from Lenders
- Credit Analysts in Banks and other financial institutions with risk appetite for agricultural lending.

The farmer should consider risks related to agriculture value chains. Some of the risks to consider are as follows:

- PRODUCTION RELATED RISKS INCLUDE:
    - The likelihood that the wrong inputs would be used for production by the farmers.
    - The likelihood that the wrong quantities of inputs would be applied.
    - The likelihood that the inputs would not be applied at the right time to effect the anticipated increased production.
    - The likelihood that there would not be enough rain for the crop.
    - The likelihood that there would be more than needed rainfall causing flooding.
    - The likelihood that the crop would be attacked by pests and diseases.
    - The likelihood that the land would not be adequately prepared for the sowing of the seeds.
    - The likelihood that the crops would be overtaken by weeds.

- MARKET RELATED RISKS INCLUDE:
    - Market availability.
    - Marketability of the crops in terms of quality and customer acceptability.
    - Good Price that allows for profitability.

- FINANCE RELATED RISKS INCLUDE:
    - Adequate financing of the value chain actors.
    - Use of the right types of financial products.

- POST HARVEST RELATED RISKS INCLUDE:
    - Likelihood that the harvested produce would not be kept well leading to deterioration in quality of the commodity.
    - Likelihood that there will not be enough and good warehouse to keep the harvest leading to spoilage.
    - Likelihood of side selling leading to a short fall in quantity that can repay the loan.

It is important to realise that anything that could affect the production of the right yields for the commodity could affect the repayment ability of the borrowers.

PROPOSED STEP-BY-STEP METHODOLOGY

- Value chain mapping including
    - Identifying the various actors along the value chain
    - Diagrammatic representation of the value chain
- Determination of the:
    - Crop calendar
    - Gross margin & return through the crop budget
- How much and timing of disbursement & repayment capacity
- A pre-approval term sheet
- Submission of credit report to loan approval committee
- Communication & consummation of
    - Loan approval
    - Terms & conditions of the loan
- Disbursement – monitoring - & loan recovery process

BANKERS' SELECTION CRITERIA FOR LENDING

1. Must have Positive Gross Margin.
2. Internal Rate of Return (IRR) calculated using the Pelrine[1] formula must be at least twice the interest rate charged by the lender. Rule of thumb is the proxy IRR >/ 2 times the lending interest rate for a bankable proposition.
3. The gross margin and the IRR could be supported with breakeven analysis, especially when deciding to acquire heavy machinery and equipment. It is necessary to know the

[1] Rich Perline's formula for IRR = Gross Margin/Cost X 100%, Source: INSPIRED, ……

scale of production at which the plant capacity is being fully utilised at optimum cost and maximum profit.

4. Apply the 5 Cs. An important tool that must be used by the lender in the process of value chain financing is the Concept of the 5 C's of Lending:

    - Miller's adapted model of the 5 C's is shown in the box below;

1. Character – suppliers, producers, purchasers and others in a value chain who interact regularly can assess the character and management savvy of each other better than a banker, with whom they have infrequent interactions. Bankers can infer the Character of their clients from Credit Reference Bureaus as well as Banker's opinions sought from other banks.

2. Capacity – Assessment is broadened from the borrower's individual capacity towards a focus on the health and growth potential of the value chain and the competiveness of those involved in it; also an individual's borrowing capacity can be strengthened because they are integrated into a strong value chain. Capacity here may also be the capital contribution made by the applicant. The rule of thumb is that the more sweat equity provided by the investor in the business the better will the business be managed and vice versa.

3. Capital – The capital of the borrower alone is less emphasized in the value chain finance, as increased attention is given to the capitalisation within the whole chain. This 'C' also denotes cash flow generated from the business as the debt contracted will be serviced by the net cash flow from the business.

4. Collateral – cash and commodity flows which can be predicted from past relations or contracts can replace or enhance traditional collateral; also in tightly integrated chains the collateral of the strongest partners can be used for attracting finance, which can be a benefit to others in the chain.

5. Conditions – Conditions for financing are more adapted to the chain; tailoring finance to fit the specific needs becomes paramount to its success and can improve 'bankability' of the clients.

SELECTION OF A VALUE CHAIN CROP

In order to select a value chain crop from a number of crops available in a Region or District, it is important for the farmer to start with a SWOT ANALYSIS.

SWOT Analysis

SWOT analysis is the analysis of the **Strengths, Weaknesses, Opportunities and Threats** of each crop to select the one that comes out strongest.

Example of a SWOT Compiled for a Grain Warehousing Company

STRENGTHS

i. Staff with good negotiation skills, striking deals
ii. Customers provide flexible payment rate to buyers
iii. Committed Staff

WEAKNESSES

i. Some staff tend to misuse the company phone
ii. Some staff are not straight forward

OPPORTUNITIES

i. Some international Policies are now prioritizing local food
ii. Some National Policies favour the Consumption of Locally Produced Grains
iii. There is local demand for Grains
iv. Supply of Grains in the Producing Communities
v. Favourable Agricultural Policy

THREATS

i. A change in Government may be associated with a change in national policies
ii. If there should be adverse weather failure, this may affect crop productivity and supplies may dwindle below profitable levels. As is being predicted, there may be weather problems this year and the Company would need a bigger warehouse to stock produce in anticipation of the outcome
iii. Some clients are not trustworthy
iv. The expansion efforts include the use of driers which run on electricity or fuel. Unreliable power supplies can pose a hindrance.

WHAT IS A CROP CALENDAR?

a. A crop calendar is the schedule of the maturing and harvesting of seasonal crops.
b. A crop calendar is a tool that provides timely information about seeds to promote local crop production.
    - It contains information on planting, sowing and harvesting period of locally adapted crops in specific agro-ecological zones.
    - It also provides information on the sowing rates of seed and planting material and the main agricultural practices.
    - This tool supports farmers and agricultural extentionists across the world in taking appropriate decision on crops and their sowing period respecting the agro-ecological dimension.
    - It also provides a solid base for emergency planning of the rehabilitation of farming systems after disasters.

    Source: (FAO.org/agricultural/seed/crop calendar)

WHY A CROP CALENDAR?

The crop calendar helps the farmer to know when to start and finish any farming activity during a crop cycle (farming season).

HOW TO PREPARE A CROP CALENDAR?

Determine the activities that are undertaken during a typical crop cycle.

Determine the timing of each activity.

Prepare a chart in the form of a calendar and colour the slot in which each activity takes place according to the timing of the activity.

EXERCISE ON CROP CALENDAR

Assist the farmer(s) to prepare his/her own crop calendar for the crop he/she has decided to cultivate for the on-coming cropping season. He/she should take into consideration the weather pattern in his/her district and the good agricultural practice he/she intends to use in cultivating the crop.

EXAMPLES OF CROP CALENDARS

Below are some examples from some parts of the country. It is possible your crop calendar may be different from the examples given based on your locality, the crop selected and your knowledge of the latest "good agricultural practices" (GAPs).

Also discuss the examples given and list possible omissions or activities you think should not have been omitted or included in the crop calendar.

Figure 7: Crop Calendar for Pepper and Garden Egg Production in Fanteakwa District, Eastern Region, Ghana

Activities\ Period	January	February	March	April	May	June	July
Land hiring							
Land clearing							
Nursing of seeds							
Stumping							
Ridging							
Planting							
Fertilizer application							
Weeding							
Chemical application							
Earthing up							
Harvesting							

Figure 8: Crop Calendar for Maize Production at Wa, Upper West Region, Ghana

ACTIVITY	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
HIRING OF LAND										
COST OF CUTLASS AND HOE										
CLEARING OF LAND AND REMOVING TREE STUMPS										
MAIZE SEED										
COST OF SOWING										
COST OF KNAPSACK SPRAYER										
FERTILIZER										
FERTILIZER APPLICATION										
HEAD PORTERAGE										
WEEDING										
EMPTY SACKS										
HARVESTING										
DEHSKING, SHELLING &BAGGING										
LOADING & OFFLOADING										
TRANSPORTATION										
STORAGE										

Figure 9: Crop Calendar for Sweet Potato Production in the Eastern Region

Activity	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Land Hiring										
Land Preparation										
Ridge raising										
Planting										
Fertilizer application										
Weeding 1										
Pesticide Application										
Weeding 2										
Harvesting										
Curing										
Storage										

WHAT IS A CROP BUDGET?

A crop budget is a listing of all estimated income and expenses associated with a specific crop to provide an estimate of its profitability.

WHY THE CROP BUDGET?

a. Crop budgets give guidance to both the farmer (producer) and the lender (banker) as to farming operations which are profitable and those which are not.
b. The crop budget may be a source of finding reasons for the poor or high profit.

c. The crop budget may demonstrate in a very critical way what differentiates a high profit farmer from a low profit earner or loss maker. Some of the reasons could be attributed to:
    - Nature of Land and the mode of acquisition
    - Application of agricultural inputs including fertilisers, and other agrochemicals
    - Timely availability and application of the inputs
    - The price on the market at the time of harvest influenced by demand and supply
    - Age of the person (farmer)

It is important to note that good agricultural practices (GAPs) play a significant role in ensuring good yield and therefore good repayment ability. Good agronomy therefore leads to good profitability, all things being equal.

d. The crop budget helps the farmer to determine his Gross Profit Margin.

    Gross Profit Margin = Sales Revenue – Total Cost of Production

    Gross Margin Percentage (%) = (Gross Profit Margin / Sales Revenue)*100

e. The crop budget helps the farmer to determine his Internal Rate of Return (IRR)

    IRR = Gross Profit Margin ⁄Total Cost of Production

f. The IRR helps us to quickly determine whether a Lender will be willing to give us a loan based on the level of return achieved

HOW IS THE CROP BUDGET PREPARED?

1. Determine Costs:
    i. Identify all activities that go into a crop cycle
    ii. For each activity determine what goes into the activity i.e. quantity, unit cost
    iii. Calculate cost of the activity by multiplying quantity by unit cost
    iv. Also slot the cost of each activity under the area of the crop calendar where the activity is expected to take place
    v. Add up cost of all activities to get Total Cost of the Crop Budget
2. Determine Revenues:
    i. Estimate Yield quantities based on past experience and good agronomic practices
    ii. Estimate Selling Price per unit of output
    iii. Multiply yield quantity by unit selling price to arrive at Sales Revenue
    iv. Sales revenue under the time sales is expected to take place under the crop calendar

3. Calculate the Gross Profit Margin
    i. Deduct total Crop Budget cost from Sales Revenue to arrive at Gross Profit Margin
    ii. Calculate Gross Profit Margin Percentage (%)
4. Calculate Internal Rate of Return Percentage (IRR %)

Examples of Crop Budgets

Table 1: ASSUMPTIONS

	unit	number per acre	unit price	Total Revenue per acre
Yield per acre of pepper	boxes	600	7.00	4,200.00

- Interest rate would remain fixed at 25% p.a.
- Harvesting would be done in May, June and July as follows, (a quarter of the total harvest in May, half in June and a quarter in July)
- An off taker is ready to purchase all harvested produce

Table 2: Crop Budget for Pepper/ Garden Egg Production in the Eastern Region

Inputs	Unit	Quantity	Unit Cost	Cost
Capital Items				
Land (hired)	Acre	1	70.00	70.00
Sub Total				**70.00**
Materials				
Seeds	Pkt	1.5	70.00	105.00
Fertilizer (NH3)	50kg bag	0.5	47.00	23.50
Fertilizer (NPK)	50kg bag	1	51.00	51.00
Weedicide	L	1	8.00	8.00
Pesticide (agricumbi)	L	1	15.00	15.00
Sub Total				**202.50**
Labour				
Land preparation	Acre	1	240.00	240.00
Transplanting	Acre	1	50.00	50.00
Fertiliser application (twice)	Acre	2	10.00	20.00
Chemical application	Acre	1	10.00	10.00
Weeding (to be done twice)	Acre	2	50.00	100.00
earthing up	Acre	1	80.00	80.00
Harvesting	Acre	1	800.00	800.00
Sub Total				**1,300.00**
Total Cost Per Acre				**1,572.50**

Table 3: Crop Budget for Maize cultivation in the Western Region of Ghana

ACTIVITY	UNIT	QUANTITY	UNIT COST (GH¢)	TOTAL COST (GH¢)
HIRING OF LAND	Acre	1	20.00	20.00
COST OF CUTLASS AND HOE	Set for 2 cycles	0.5	20.00	10.00
CLEARING OF LAND AND REMOVING TREE STUMPS	Acre	1	35.00	35.00
MAIZE SEED	1 kg pack	9	2.50	22.50
COST OF SOWING	Acre	1	20.00	20.00
COST OF KNAPSACK SPRAYER	set for 10 cycles	1	50.00	5.00
FERTILIZER	50kg	2	45.00	90.00
FERTILIZER APPLICATION	Man day	8	5.00	40.00
HEAD PORTERAGE		2	3.00	6.00
WEEDING	Acre	2	35.00	70.00
EMPTY SACKS	use for 2 cycles	8	1.20	4.80
HARVESTING	Acre	1	40.00	40.00
DEHUSKING, SHELLING &BAGGING	Bag	8	4.00	32.00
LOADING & OFFLOADING	Bag	8	3.00	24.00
TRANSPORTATION	Bag	8	3.00	24.00
STORAGE	Bag	8	1.00	8.00
TOTAL COST				451.30
REVENUE				
SALES OF PRODUCE	Bag	8	80.00	640.00
GROSS PROFIT MARGIN	188.70			
GROSS PROFIT MARGIN %	29.48			
INTERNAL RATE OF RETURN (IRR)	41.81			

WHAT IS A CASH FLOW?

Cash flow means inflow and outflow of cash. An inflow i.e. source of cash increases the total cash available at the disposal of a farmer or the firm while an outflow i.e. use of cash decreases it.

The difference between cash inflow and cash outflow is known as net cash flow which can be net cash outflow.

WHY THE CASH FLOW

The cash flow helps the farmer to determine:

i. How much cash to spend

ii. When to spend

iii. How much to pay back in terms of loans taken from the bank

iv. Timing of repayments

The cash flow is also used as a monitoring tool.

HOW IS THE CASH FLOW PREPARED?

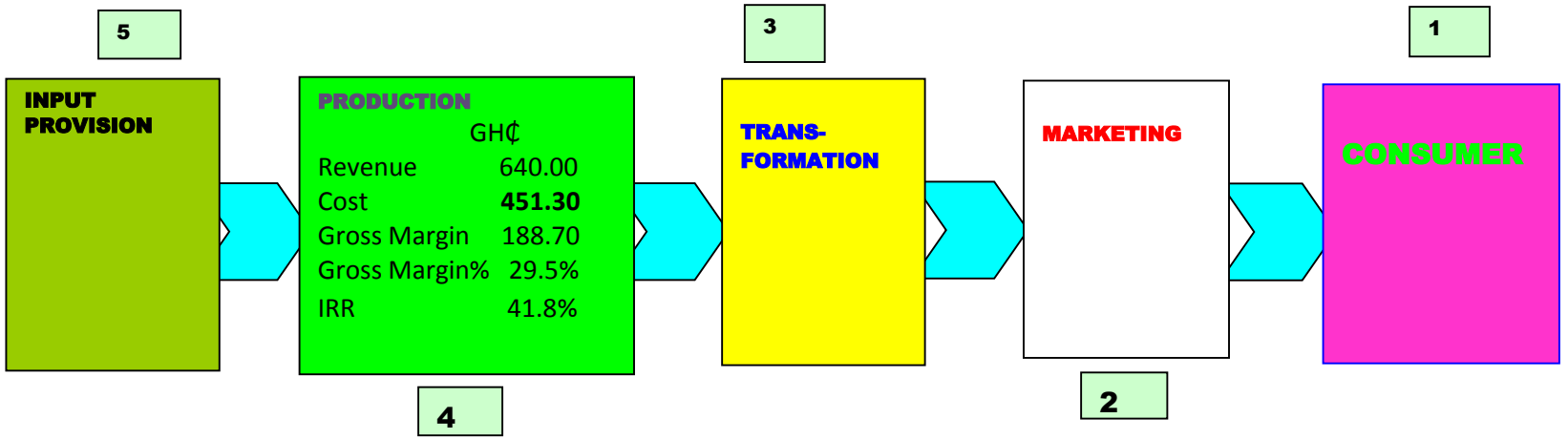
Preparation of the cash flow is based largely on the crop budget which is spread according to the timing of the activity under the crop calendar. The following procedure should be undertaken in preparing the cash flow projection.

a. Structure the cash flow into two sections i.e. inflows and outflows.
    - Inflows mean cash coming into the business e.g. sales revenues
    - Outflows mean cash paid to other parties for services they have rendered to the farmer i.e. all the cost activities in the crop budget.
    - Sum up values under each category i.e. to get total inflows and total outflows
b. Deduct total outflows from total inflows to arrive at:
   NET CASH FLOW BEFORE FINANCING
c. Determine which activities require loan financing
d. Determine when disbursement of loan requirements will be needed
e. Net Cash flow plus loan requirement gives u
   NET CASH FLOW BEFORE DEBT SERVICING

f. Determine Loan repayment and interest payments and their timing. This is done by first preparing a LOAN REPAYMENT SCHEDULE and the amounts determined slotted into the cash flow.
g. Deduct Loan repayment and Interest payments from NET CASH FLOW BEFORE DEBT SERVICING to arrive at NET CASH FLOW AFTER DEBT SERVICING
h. Do a cumulative Cash Balance to determine cash level at any point in time.

Step 1

Diagramatic Representation of the Value Chain for Maize

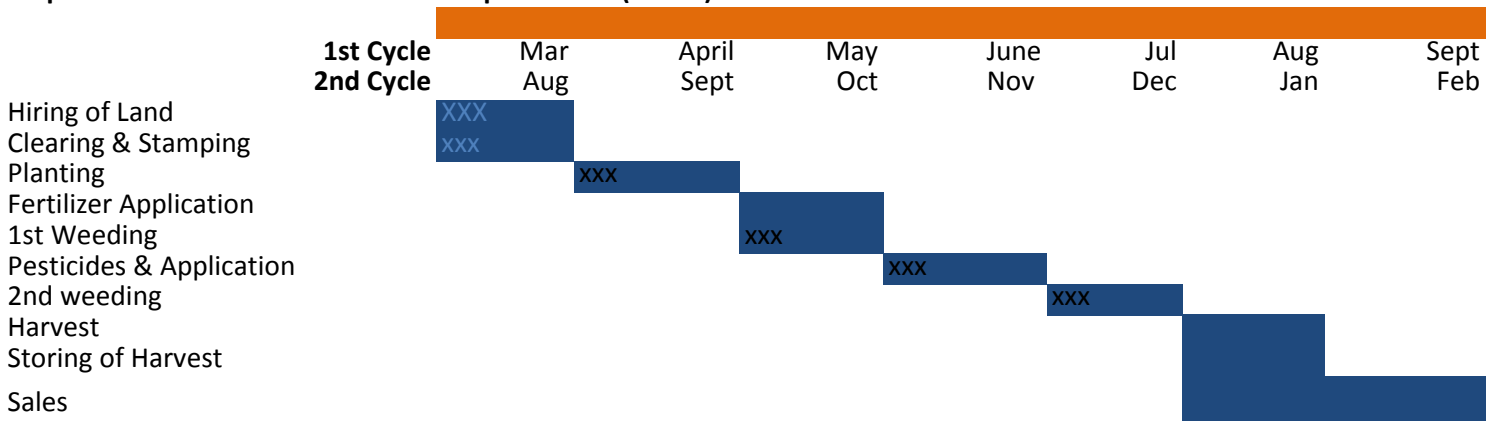


ACTORS

Large /medium suppliers Extension Officers Financial Institutions	Farmers	Local Processors Commercial Processors Warehouse Operators	Retailers Exporters Middlemen Transporters	Individuals Households Hoteliers Restaurant Operators

Step 2

Crop Calendar (Maize)



Step 3

Crop Budget Per Acre- Determining the Gross Margin

	Unt	Qty	Per Acre Unit Cost	Amount Per Acre	Mar Aug	April Sept	May Oct	June Nov	Jul Dec	Aug Jan	Sept Feb
Hiring of Land	Acre	1	20	20	20						
Clearing & Stamping	Acre	1	35	35	35						
Maize Seed	1-kg pack	9	2.5	22.5		22.5					
Planting Labour	Acre	1	20	20		20					
Cutlass&Hoes (1+3)Set	set	1	10	10	10						
Knapsack Sprayer (Dprn over 10cycles)	pcs	1	50.00	5			5				
Fertilizer	50kg bag	2	45.00	90			90				
Fertilizer Application	manday	8	5	40			40				
Head porterage of Fertilizer	bag	2	3	6			6				
1st Weeding	Acre	1	35	35			35				
Insecticide	Lts			0			0	0			
Insecticide Application	Acre			0				0			
2nd weeding	Acre	1	35	35					35		
Sacks (over 2 Cycles)	pcs/Acre	8	1.2	4.8						4.8	
Harvesting	Acre	1	40	40						40	
Dehusking, Shelling, bagging	bags	8	4	32						32	
Loading & offloading	bags	8	3	24						24	
Transporting produce	bags	8	3	24						24	
Storage	bags	8	1	8						8	
Total Cost				451.30	65	42.5	176	0	35	132.8	0
Sales		8	**80**	**640**							640
Profit Margin per Acre			29.5%	**188.70**							
Internal Rate of Return				**41.8%**							

No. of Acres Financed **5**

Step 4 **Cash Flow Projections - Quantum and Timing of Disbursements, Repayments & as Monitoring tool**

					1st Cycle	Mar	April	May	Jun	Jul	Aug	Sep
					2nd Cycle	Aug	Sept	Oct	Nov	Dec	Jan	Feb
	Bags/acre					GH¢	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
INFLOWS												
	Yld bg/acre	Acres	Price/Bag									
Sales (Maize)	8	1	80									640
Total Inflow						-	-	-	-	-	-	640
OUTFLOWS	Unt	Qty	Unit Cost	Amount		Mar	April	May	Jun	Jul	Aug	Sep
						Aug	Sept	Oct	Nov	Dec	Jan	Feb
						GH¢	GH¢	GH¢	GH¢	GH¢	GH¢	GH¢
Hiring of Land	Acre	1.0	20	20		20						
Clearing & Stamping	Acre	1.0	35	35		35						
Maize Seed	1-kg pack	9	2.5	22.5			22.5					
Planting Labour	Acre	1	20	20			20					
Cutlasses &Hoes (1+3)*5set	set	1	10	10		10						
Knapsack Sprayer	pcs	1	50	50				50				
Drought Insurance	Policycover	1	20	20				20				
Fertilizer	50kg bag	2	45	90				90				
Fertilizer Application	manday	8	5	40				40				
Head porterage of Fertilizer	bag	2	3	6				6				
1st Weeding	Acre	1	35	35				35				
Insecticide	Lts	0	0	0					0			
Insecticide Application	Acre	0	0	0					0			
2nd weeding	Acre	1	35	35						35		
Sacks	pcs/acre	8.0	1.2	9.6							9.6	
Harvesting	Acre	1	40	40							40	
Dehusking, Shelling, bagging	bags	8	4	32							32	
Loading & offloading	bags	8	3	24							24	
Transporting produce	bags	8	3	24							24	
Storage	bags	8	1	8							8	
Total Outflow				521.10		65.00	42.50	241.00	0.00	35.00	137.60	0.00
Net Cash Flow						-65.00	-42.50	-241.00	0.00	-35.00	-137.60	640.00
Loan Requirement/Disburements (GH¢)		521.10				348.50			0.00	172.60		
Net Cash flow before Debt Servicing						283.50	-42.50	-241.00	0.00	137.60	-137.60	640.00
Loan & Interest Repayment												586.23
Net Cash flow after debt Servicing						283.50	-42.50	-241.00	0.00	137.60	-137.60	53.77
Cumulative Cash Balance						283.50	241.00	0.00	0.00	137.60	0.00	53.77
												268.87

Interest Calculation:		Reducing Balance & on Disbursed Amounts						
	1st Cycle	Mar	April	May	Jun	Jul	Aug	Sep
	2nd Cycle	Aug	Sept	Oct	Nov	Dec	Jan	Feb
Loan at Start of Month		0	355.76	363.17	370.74	378.46	562.54	574.26
Loan taken during the month (in 2 tranches per cycle)		348.50				172.60		0.00
-1st tranche (From Land hiring to 1st weeding)								
-2nd tranche (From 2nd weeding to Storage)								
Interest for the month	65	7.26	7.41	7.57	7.72	11.48	11.72	11.96
		355.76	363.17	370.74	378.46	562.54	574.26	586.23
Repayments								
Interest		0	0	0	0			11.96
Principal		0	0	0	0			574.26
Total Repayments		0	0	0	0	0	0	586.23
Loan Outstanding at month end		355.76	363.17	370.74	378.46	562.54	574.26	0.00

Step 6 PROPOSED CHECKLIST FOR FIELD VISIT

Yield per acre
Price per bag
Minutes of previous group meeting
Due deligence on group leaders
Group Bank account (Bank a/c no.)
Group Bank statement over 2 to 3years.
List of Group membership
Request for group meeting to validate list of members
Evidence of Land ownership or rental agreement
Verification of originals of award certificate
Validate Equity Contribution by Group

Step 7 **PRE-APPROVAL TERM SHEET FOR …….. MAIZE FARMING GROUP**

Name:	MAIZE FARMING GROUP
Location:	……..District
Acreage:	5

	Per Acre	Total		
Loan Amount Approved:	GHC **521**	**2605.5**	Date of Approval:	month, 2013

Approving Authority:	Loan Approval Committee, ……. Rural Bank
Purpose of Loan:	Cultivation of …….. Acres of Maize
Tenure:	7 Months
Processing Fee:	1% Flat on amount approved
Interest Rate:	25% pa (2.0833% per mth)
Penalty	1% Flat on any amount defaulted.
Disbursement Schedule:	2 installments [March or August 2013] and [Jul or Dec 2013)
Repayment Schedule:	One (1) installment (as per attached Loan Repayment Schedule Appendix 4)
Security:	Assignment of Farm Produce
	Group Guarantee
	Indemnity /Guarantee by Group Executive
Special Condition:	Group to sign an undertaking to chanel all sales proceeds through their Bank Account
	All beneficiaries to be trained under the scheme
	All other lending terms and conditions of the Bank shall apply

……

Signature

Recommended Disbursement Schedule

Date		**Amount**
1st Cycle	**2nd Cycle**	**GHc**
Mar 2013	Aug 2013	349
April 2013	Sept 2013	-
May 2013	Oct 2013	-
Jun 2013	Nov 2013	-
July 2013	Dec 2013	173
Aug 2013	Jan 2014	-
Sept 2013	Feb 2014	
Total		**521**

COLLATERAL CONDITIONS & ANY OTHER TERMS

RISKS & MITIGATING ACTIONS

POSSIBLE RISKS	MITIGATING ACTIONS
Weather leading to crop failure	Take Drought/ weather insurance
Poor yield	Ensure good agronomic practice
Poor storage	Ensure harvesting is done with the involvement of the off-taker
Fall in price	Institute Contract farming arrangement with buyers
Delayed disbursement of Funds	Ensure loan application process is started early enough to avoid bottlenecks
Inadequate amounts disbursed	Ensure input quantities and prices are properly assessed and relevant to local conditions
Transportation and marketing problems	Ensure adequate arrangement is made with a reliable transporter

Step 8 **SUBMISSION OF CREDIT REPORT TO LOAN APPROVAL COMMITTEE OF ---------- RURAL BANK**

FROM: Credit Manager TO: Executive Committee
Date: ----------,2013

REQUEST TO FINANCE THE CULTIVATION OF ---- ACRES OF MAIZE BY ……FARMERS (FBO) GROUP

EXECUTIVE SUMMARY

---------- ZONE

Nature of Business: Maize Production

Total Number of Acres proposed for funding by ---------- RCB: 5
Market/Sales: 100% sale to local market (processor/aggregator/retailer)

	No. of Acres	**Amount / GHc**	**Total** GHc
Cost of Cultivating ----- Acres (Cashflow):	5	521	2,605.50
Cost of Cultivating ------Acres (crop Bdgt):	5	451	2,256.50
Group's Equity Contribution:		N/A	
Loan Recommended:	5	521	2,605.50

Reconciliation of Difference between Crop Budget total & Cash Outflow total

Total per Crop Budget	5	451.30	2,257
Deduct:			
Knapsack Sprayer (Dprn over 10cycles)	5	-5.00	-25.00
Sacks	5	-4.80	-24.00
Add:	No. of Acres		
'- Crop (weather/drought) insurance	5	20.0	100
Knapsack Sprayer (Dprn over 10cycles)	5	50.0	250
Sacks	5	9.6	48
Total per Cash outflow		521	2,606

Note: If equipment are depreciated and only depreciated portion included in Crop budget, the depreciated amount will be deducted and the full cost of the equipment included in the cashflow will be added to arrive at the total cash outflow

Cash Balances Generated by Cashflow after Debt Servicing (Base Case)

		Per Acre		No. of Acres	Total	
		Month	**Cumulative**		**Month**	**Cumulative**
1st Cycle	**2nd Cycle**	GHc	GHc	5	GHc	GHc
Mar 2013	Aug 2013	283.50	283.50		1417.5	1417.5
April 2013	Sept 2013	-42.50	241.00		-212.5	1205
May 2013	Oct 2013	-241.00	0.00		-1205	0
Jun 2013	Nov 2013	0.00	0.00		0	0
July 2013	Dec 2013	137.60	137.60		688	688
Aug 2013	Jan 2014	-137.60	0.00		-688	0
Sept 2013	Feb 2014	53.77	53.77		268.87	268.87