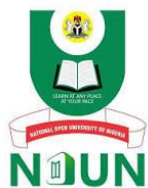


COURSE GUIDE

AEA 302 AGRICULTURAL FINANCE

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**MAIN
COURSE**

CONTENTS

Module 1	Agricultural Finance	1
Unit 1	Meaning and Scope of Agricultural Finance.....	1
Unit 2	Classification of Credit.....	8
Unit 3	Importance of Credit to the Farmer.....	19
Unit 4	Farm Records Keeping for Financial Decision Making.....	24
Unit 5	Farm Accounts for Financial Management	32
Module 2	Basic Economic Principles for Agricultural Finance.....	36
Unit 1	Input-Output Relationships (Law of Diminishing Returns)	36
Unit 2	Input-Input Relationships	48
Unit 3	Product-Product Relationships.....	54
Unit 4	Principles of Equi-marginal Returns and Opportunity Cost.....	63
Unit 5	Law of Comparative Advantage.....	70
Unit 6	Cost Functions.....	75
Module 3	Capital	83
Unit 1	Internal Methods of Acquiring Capital.....	83
Unit 2	External Methods of Acquiring Capital.....	90
Unit 3	Internal and External Sources of Capital.....	105
Unit 4	Agricultural Credit Banks.....	114
Module 4	Economic Financial Tools	120
Unit 1	Concept of Interest Rates.....	120
Unit 2	Analysis of Interest Rates on Loans.....	129
Unit 3	Three R's and Five C's of Credit.....	138
Unit 4	Seven Ps of Credit.....	148

Module 5	Economic Financial Tools.....	154
Unit 1	Acquisition of Capital and Attendant Risks... ..	154
Unit 2	Planning and Budgeting.....	166
Unit 3	Net worth Statement.....	172
Unit 4	Income Statement.....	180
Module 6	Economic Financial Tools.....	187
Unit 1	Cash Flow.....	187
Unit 2	Compounding.....	196
Unit 3	Discounting.....	202
Unit 4	Capital Budgeting.....	206
Module 7	Costs and Risks in Agricultural Lending.....	214
Unit 1	Types of Risks and Strategies to Reduce Risk.....	214
Unit 2	Problems Encountered by Government Institutions.....	222
Unit 3	Agricultural Loan Delinquency and Diversion in Nigeria.....	232
Unit 4	Subsidising Agricultural Credit and Inputs in Nigeria.....	242
Module 8	Agricultural Insurance.....	249
Unit 1	Meaning and Scope of Agricultural Insurance.....	249
Unit 2	Types of Agricultural Insurance and Insurability of Agricultural Risks.....	254
Unit 3	Agricultural Insurance in Nigeria.....	259
Unit 4	Risk Quantification.....	266
Module 9	Agricultural Marketing	275
Unit 1	Agricultural Marketing.....	275
Unit 2	Market	283
Unit 3	Marketing Functions.....	292
Unit 4	Marketing Surplus.....	300
Unit 5	Marketing Channels	304
Appendix I		310
Appendix II.....		311

MODULE 1 AGRICULTURAL FINANCE

Unit 1	Meaning and Scope of Agricultural Finance
Unit 2	Classification of Credit
Unit 3	Importance of Credit to the Farmer
Unit 4	Farm Records Keeping for Financial Decision Making
Unit 5	Farm Accounts for Financial Management

Unit 1 Meaning and Scope of Agricultural Finance

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Meaning of Agricultural Finance
- 1.4 Nature of Agricultural Finance
- 1.5 Scope of Agricultural Finance
- 1.6 Financial Intermediaries
- 1.7 Summary
- 1.8 References/Further Readings/Web Resources
- 1.9 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

This unit is very important because it gives the basic definition of agricultural finance and explains what it entails. It describes the nature and the scope of agricultural finance and the necessity for deep understanding of its subject matter. It provides the foundation and general understanding of the course as a whole. It will also help you to understand subsequent units.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define agricultural finance
- describe the nature of agricultural finance
- explain the scope of agricultural finance within the context of traditional farming and developed agriculture
- explain the necessity and role of financial intermediaries.

1.3 Meaning of Agricultural Finance

Agricultural finance simply describes how production and other activities in agriculture are financed in order to get optimal output. Research has shown that in most developing countries, majority of the farmers are poor; they are small holders and as such cannot adopt new technologies, such as improved seeds, fertilisers, herbicides and other useful inputs like tractors.

To acquire such improved inputs, a significant degree of capital is required. In agriculture, capital includes such items as simple tools, machinery, seeds, fertilisers, chemicals and livestock. It also includes the valuable improvements that farmers make on the land, often with their own labour, in clearing, draining, fencing, developing water supplies, planting tree crops and the like. In addition to capital employed directly on the farm, agriculture also requires a vast amount of capital for the farm supplies, processing and marketing. Therefore, agricultural finance is an economic study of financing agricultural activities with the aim of increasing profit which otherwise would have been impossible.

1.4 Nature of Agricultural Finance

A major distinction between traditional and developed agriculture is the kind and amount of capital used by farmers in the production process. For the small-scale farmers who are poor, they do not have adequate capital therefore; they use hoe-and-cutlass type of technology. This is the traditional way of farming. With this type of technology, research has shown that a farmer can only produce about 1/10 horse power, whereas the minimum production a farmer needs to be able to live well is ½ horse power. Consequently, the small-scale farmers using the hoe-and-cutlass technology continues to go round the vicious circle of poverty. This is a situation where the father is poor, the son is poorer and the grandson is poorest. In modernised agriculture, the farmer combines his labour with more capital in the form of simple machines, improved seeds, fertiliser, herbicides and pesticides. The result is a remarkable increase in the amount he is able to produce out of the available capital.

There are three ways of getting finance for inputs for increased agricultural production. These are capital, savings and credit. In the developing countries where the majority of the farmers have little more than subsistence and most of them are poor, they do not have capital for such inputs. Similarly, because their production is low, their Marginal Propensity to Consume (MPC) is high, while their Marginal Propensity to Save (MPS) is low. Since savings is low, they cannot get finance for increased agricultural output through savings. The only alternative left is

credit. Even this credit alternative has many bottlenecks that make it difficult for the poor farmers to access. The one-million-naira question is, if small scale farmers in developing countries do not have capital because of poverty, and they cannot use their savings because their MPS is too small and they cannot access credit, how can the agricultural sector be developed? This problem leads to the role of financial intermediaries.

Modern farming in Nigeria, as in other businesses all over the globe, requires proper combination of productive assets such as land, livestock and machinery with available labour and managerial ability. Capital for acquiring productive assets is essential for success. Under subsistence farming, a man earns his living by the sweat of his brow. Today, man earns his living by use of capital.

Self-Assessment Exercise 1

1. What do you understand by agricultural capital?

1.5 Scope of Agricultural Finance

Today, the size of capital a farm-family controls, the terms and conditions under which it is obtained and the way it is used determine to a large extent the level of income especially as farming becomes more commercialised. Agricultural finance provides the knowledge of fundamental principles and analytical procedures of obtaining and using capital effectively.

Agricultural finance includes those parts of the field of agricultural economics that pertain to finance. **Financial management** and **farm management** are synonymous in many respects. This overlapping is natural since farm management is the primary activity, with financial management contributing to overall management of the farm firm. However, financial management includes some things not ordinarily included in farm management.

Financial management in its broadest sense has two aspects, namely macro finance and micro finance. Macro finance management pertains to overall aspects of finance in the viewpoint of society, the agricultural industry, lending institutions, etc. Micro financial management, however, is concerned with finances from the viewpoint of managing the individual farm or business firm. It includes those parts of farm management which relate to acquisition and use of capital in the farm business. Acquisition involves determining the sources of capital and the amount to be obtained from each source. It involves the terms and conditions under which the capital is obtained. The use of capital

involves allocating the limited supply of capital available between farm household and the farm business. It includes determining how to use the capital to maximise income.

The study of agricultural finance helps provide the useful economic principles for analysis of how much it would be profitable and safe to borrow. It provides the borrower with the principles of the types of information needed by the lender. It helps the farmer to determine how much capital it will pay to use. Analysis of repayment capacity and risk bearing ability of the farmer indicates the amount of credit a farmer can safely use. Information on legal aspects of borrowing, the lender's analysis on servicing of loans, and the like, add efficiency and confidence in "shopping" for credit. The knowledge of various types of lenders and their characteristics helps the farmer select the one that will contribute most to his business activities.

1.6 Financial Intermediaries

One problem with most societies is that savers generally have no way of knowing those who are anxious to borrow their savings and use them for increased agricultural production. Most of the people who go to Agricultural bank to borrow money always claim that they want to use such money to increase agricultural production, but experience has shown that less than 10% of those who got such money use it for farming. Instead, they use the money for consumption purposes like burial, naming ceremonies or marrying more wives and feeding more mouths.

On the other hand, would-be borrowers also face a similar problem. They do not know where to go for the needed funds. Yet, it is essential that the savings be used somewhere by somebody in the economy for production purposes in order to maintain the circular flow of income and prevent the savings from becoming sterile and counterproductive. The task of providing the link between suppliers and users of savings is performed by middlemen who are known as financial intermediaries.

Financial intermediaries are people who provide the link between suppliers and users of savings. These include formal and informal institutions. The formal institutions are made up of banks, building societies, credit unions and village saving societies. The informal institutions, on the other hand include friends, relatives, moneylenders, traditional savings and credit groups. All these people make money available to farmers in the form of credit at varying interest rates. Some interest rates could be as high as 100 percent. There are situations where a farmer borrows ₦20,000.00 and he is expected to pay back 10 percent which is ₦2,000.00 every month for as long as he keeps the money and at the end, he must pay back the ₦20,000.00 he had borrowed. In

Nigeria, an informal farmers' association serves as the intermediary for its members. The association meets monthly or bimonthly and at each meeting some members deposit funds which others obtain as loan. No fund is taken to the bank because all the money deposited are loaned out and all the transactions are done in the presence of all members.

Financial intermediaries are part of the broader concept of rural financial markets with man-made rules and regulations which guide the behaviour of people. It is important to know that the intermediation process is not a one-way flow of funds from savers to users through intermediaries. The borrowers must provide some evidence of debt obligation to the intermediaries that provide the funds in return for the loan. Thus, there is always a reverse flow of securities such as promissory notes or mortgages from the borrowers to the intermediaries that make the loans available.

Financial intermediation plays a significant role in providing the agricultural sector with a large amount of funds needed for development.

Some farmers themselves provide part of their own capital needs directly through savings from cash income. Others invest their labour and local materials in order to get money to improve their farms. Distributors of farm supplies and savings can also be mobilised through cooperatives and indirectly through marketing organisations and inputs. It should however be recognised that financial intermediaries whether formal or informal, may divert savings from agriculture to other sectors of the economy. That is, instead of investing in agricultural activities, they may channel the accumulated savings under their control to more profitable ventures in the urban centres. This is so because the interest rates that are paid in such ventures are sometimes more than double what is paid on agricultural loans.

Self-Assessment Exercise 2

- | |
|---|
| 1. Explain the two aspects of financial management. |
|---|

1.7 Summary

In this unit, you have learnt the meaning, nature and scope of agricultural finance. The unit explains agricultural finance as summarised below:

- it describes how production and other activities in agriculture are financed in order to get optimal output;
- it is an economic study of financing agricultural activities with the aim of increasing profit;

- the study of agricultural finance helps provide the useful economic principles for analysis of how much it would be profitable and safe to borrow;
- it is about financial management from both the borrowers and the lenders perspective.

Also, you have learnt about the usefulness of financial intermediaries. The unit has highlighted that the financial intermediaries play a significant role in providing the agricultural sector with a large amount of funds needed for development.

1.8 References/Further Readings/Web Resources

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1.9 Possible Answers to Self-Assessment Exercise(s)

Self-Assessment Exercise 1

In agriculture, capital includes such items as simple tools, machinery, seeds, fertilisers, chemicals and livestock. It also includes the valuable improvements that farmers make on the land, often with their own labour, in clearing, draining, fencing, developing water supplies, planting tree crops and the like. In addition to capital employed directly on the farm, agriculture also requires a vast amount of capital for the farm supplies, processing and marketing; therefore, agricultural finance is an economic study of financing agricultural activities with the aim of increasing profit which otherwise would have been impossible.

Self-Assessment Exercise 2

Financial management in its broadest sense has two aspects, namely macro finance and micro finance. Macro finance management pertains to overall aspects of finance in the viewpoint of society, the agricultural industry, lending institutions, etc. Micro financial management, however, is concerned with finances from the viewpoint of managing the individual farm or business firm.

Unit 2 Classification of Credit

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Production versus Consumption Types of Credit
- 2.4 Time Classification or Length of Credit
- 2.5 Purpose Classification
- 2.6 Security Classification
- 2.7 Lender Classification
- 2.8 Other Useful Hints
- 2.9 Summary
- 2.10 References/Further Readings/Web Resources
- 2.11 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

In finance, the word credit is referred to as the process of obtaining control over the use of money in the present, in exchange for a promise to repay at a future date. That means that the borrower will have the use of money that is not his own now and will promise to repay on the terms specified in the loan agreement between him and the lender. In this manner, the lender forgoes the use of his money by extending credit to the borrower. There are two main purposes for which farmers borrow money, for production and for consumption. In this unit, you will learn about the various types of purposes for borrowing and the various ways credit is classified.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- classify credit by length of time of repayment
- classify credit by purpose of use
- classify credit based on security
- classify credit by lenders' policies.

2.3 Production versus Consumption Types of Credit

As mentioned in the introduction, there are two basic purposes for which borrowed funds are used, namely, production and consumption.

Production credit is the type of credit that is used for production purposes. Such a fund is used to undertake economic activity such as farming, so that the borrower will have a higher net income after he has repaid the loan. This type of loan is referred to as dynamic because it increases the borrowers' income and helps him to repay the loan when it is due. Consumption credit, on the other hand, is the credit that is used for consumption purposes only. Such use is static because it does not increase the borrowers' income or help him repay the loan when it becomes due.

It is however proper to note that not all loans fit neatly into these two dichotomies. For example, when a small farmer borrows money and buys a bicycle, both production and consumption aspects are involved. This is because he will probably use the bicycle to transport his harvest from the farm and also use the bicycle to visit friends. When he uses the bicycle to transport his harvest from the farm, the credit is production credit, but when he uses the bicycle to visit friends it is consumption credit. If the farmer uses part of his credit to buy a radio, when he listens to educational programmes that can help him improve his farm productivity, it is production credit, but when the radio provides him entertainment, it is consumption credit.

The role of credit in financing production and consumption for small farmers in developing countries is an issue around which there is considerable debate. Most formal credit institutions will give credit for production activities only, but will not give such credit for consumption. This is an understandable position for the lenders because the farmer who uses the credit for consumption purposes may not be able to repay the credit when the loan becomes due.

Sometimes, the matter is so complex that such a stand will sound unreasonable. Take the case of institutionalised agricultural lenders of Tunisia who will approve loans on feed, shelter and veterinary services of work animals as legitimate production credit, but when it comes to food, clothing, shelter and health care for the farm labourers and his family it will be disapproved. For the small farmer who operates a labour-intensive system of farming, labour is his major input. Thus, it is important for the lender to think about the inputs farmers use before approving or disapproving farmers' requests for credit. Otherwise, the lender may fall into the same type of error like the institutionalised agricultural lenders of Tunisia.

We are concerned here with business credit. However, there are many different types or uses of business credit, and a proper classification will facilitate communication, and also financial analysis. Unfortunately, no one classification is completely satisfactory for all purposes. Therefore, four primary classifications are summarised here. The one based upon time or term of loan is probably used most frequently.

2.4 Time Classification or Length of Credit

In the Time Classification, credit is classified into three groups – short, intermediate and long terms – according to the term of the loan. The following general classification is customary, together with the further division into monthly, seasonal and annual loans.

1. Short-term credit (production credit)

- a. Monthly (0 - 3 months)
- b. Seasonal (3 - 9 months)
- c. Annual (9 months - 1 year)

Short-term credit is sometimes called seasonal credit because it is used to purchase materials which are used up in one season or one production cycle such as seeds, fertilisers, labour and pesticides. Medium-term credit, on the other hand, is used to finance items that have a production life that covers several years, such as breeding animals. Long-term credit is always used to finance the purchase of land, the construction of permanent buildings, clearing trees and establishing irrigation systems.

2. Intermediate-term credit (1 – 5 years)

Intermediate credit is usually defined as credit extended for purposes which will provide full payment, not in one season, but in several seasons. The term intermediate credit has been used to designate those loans maturing in a year but renewed from year to year if the security and the income of the borrower is warranted. Loans on dairy herds, beef cattle herds, improvements and machinery come in this category. Moreover, the so-called “barnyard” loans – loans which are written for one year but which the lender does not expect the borrower to repay completely in that time – sometimes are also included in this class.

3. Long-term credit (real estate credit)

Long-term loans fall definitely into a separate grouping, being as the name implies, credit extended on real estate security for periods longer than one year, usually five, ten, twenty, or more years, depending on the terms offered by the mortgage lenders. An equally specific classification is not possible, however, for short-term credit and intermediate-term credit.

Such an overlapping in classifying short-term credit and intermediate term credit makes for confusion, as the following examples will illustrate. A farmer raising crops borrowed ₦50,000 each year to finance his crop expenses. A livestock farmer borrowed ₦50,000 on his herd, renewing the note each year as at when due. The short-term loan to the crop farmer enabled him to produce a cotton crop, while the intermediate-term loan on the beef cattle herd enabled the livestock farmer to produce a crop of beef calves each year. It may be argued that the crop loan was continuous over several years. But each farmer had to have the ₦50,000 to finance his business, year after year, the only important difference being that the cotton farmer needed the credit a few months of the year while the livestock farmer needed it the entire year. This is a difference largely of degree, depending on the number of months required to raise crops or produce livestock.

A bona fide intermediate loan is one used for investments which mature over a period longer than a year. Orchards, livestock equipment, drainage or irrigation systems and machinery are good examples of investments in intermediate category.

The distinction between short, intermediate and long-term credit coincides with a difference in loan purpose. Short-term loans are generally used for the production of farm crops and livestock; intermediate-term loans are generally for working-capital assets like machinery; and long-term loans are frequently for the purchase of a farm. A classification of credit according to purpose brings out this close relationship between time and purpose.

Self-Assessment Exercise

- | |
|---|
| 1. Differentiate between short-term, intermediate and long-term loans |
|---|

2.5 Purpose Classification

The purpose classification appears to be the easiest to understand because each loan is labelled according to the use made of the proceeds. This classification generally groups loans according to the purpose of the loan, with subclasses based upon specific uses of the funds.

Among the common uses made of credit, the following are the most important:

1. Production loans (short- and intermediate-term loans) to:

1. Buy seed, feed, fertiliser and hiring labour
2. Pay operating expenses
3. Buy livestock feeders
4. Fattening livestock
5. Buy dairy cattle
6. Buy machinery – equipment or tractor
7. Finance commodity storage
8. Refinance any one or combinations of the above.

2. Real estate loans (long-term loans) to:

1. Purchase a farm
2. Purchase additional land
3. Finance buildings, drainage, irrigation and other improvements
4. Refinance any one or combinations of the above.

3. Farmer cooperative borrowing to:

1. Pay operating expenses
2. Finance patrons
3. Finance commodity storage
4. Finance buildings, equipment, or real estate purchase
5. Refinance any one of the above.

The purpose classification has the advantage of facilitating analysis to determine profitability of a specific loan if other records essential to such an analysis are kept. It also gives information on which loans are for investment purposes and which are for operating credit. Long-term loans for purchase of land usually are primarily for investment since the land is not “used up” in the production process. On the other hand, funds put into operations of the farm are used up in one or a few ways. Production expenses, such as for seed, are completely used in one year, while a tractor lasts for several years. These things are important from the viewpoint of using credit since they influence the repayment capacity of farmers. Where items are used up in the production process, their value enters the gross cash farm income flow, assuming operations are profitable, and are available for repayment of the loan. Funds put into a tractor which lasts ten years, for example, enter the cash income flow over the ten-year period and can be used to apply on the tractor loan. In contrast, where investments are not used up, only the return on the investment enters the cash flow, with the result that principal payments on loans thus invested must be taken from net income or savings. This limits the amount of debt a farm family can incur for investment purposes.

A common difficulty incurred with the purpose classification arises when a loan is used for a number of different purposes. “Combination” loans used in diversified farming and crop mixtures are examples of loans which are difficult to classify.

2.6 Security Classification

The grouping of credit by security provides a third classification often used. The two major classifications are secured and unsecured loans, as the following outline indicates:

1. Secured loans

i. Short- and intermediate-term loans

- a. Chattel mortgage loans.
 - (1) Crop
 - (2) Livestock
 - (3) Machinery, equipment or tractor
 - (4) Commodity
 - (5) Mixed loans.
- b. Warehouse receipt loans.
- c. Loans made on collateral securities (government bonds and the like).

ii. Long-term loans

- a. Real estate mortgage loans.

2. Unsecured loans

i. Short- and intermediate-term loans.

- a. Crop
- b. Livestock
- c. Machinery, equipment or tractor
- d. Commodity
- e. Mixed loans.

Short- and intermediate-term loans may be either secured or unsecured. An unsecured credit is based solely on good reputation of the borrower. For example, if the Vice-Chancellor of Ahmadu Bello University walks into one of the banks in Samaru village and wants to borrow ₦500,000.00 only, he may be given the money based on his good reputation without asking him for security. However, if he fails to repay when the loan is due, the lender has little opportunity of obtaining his funds.

When short- and intermediate-term loans are secured, they usually are secured by chattel (usually movable) property. As a result, loans for short- and intermediate-term purposes are often referred to as “chattel” loans.

Long-term loans generally are secured by a mortgage on real estate, such as land and buildings. When the term “farm-mortgage loans”, or debt is used, it generally refers to loans secured by farm real estate. This means that if the borrower fails to pay back when the loan is due, the property may be taken over by the lender.

Small farmers, however, do not have security to give to the lenders. This is because they cannot give the family land they farm as collateral. The property owned by a small farmer may comprise only of small tools and implements such as hoes, cutlasses and may be a bicycle. These have low values and cannot be accepted by the lenders.

2.7 Lender Classification

Credit often is classified by the lender because the policies of lenders vary greatly. Quite often this classification is used in conjunction with the time grouping, as the following summary classification illustrates:

1. Short- and intermediate-term (non-real-estate) loans

1. Banks
2. Production credit associations
3. Other financing institutions
4. Commodity credit cooperatives
5. Individuals and others.

2 Long-term (real estate) loans

1. Commercial and savings banks
2. Insurance companies
3. Individuals and others.

Lenders also are often classified as either formal or informal or as institutional or non-institutional. The formal sources of credit include government credit institutions, cooperatives and commercial banks. They are formal in the sense that their operating procedures and loan terms tend to be standardised and subject to Central Bank control. That is, most of the time the interest rate that they charge borrowers is dictated by the Central Bank. The informal lenders are not so. They include merchants, traders, produce buyers, money lenders, friends and relatives. Credit transactions among these lenders are on personal basis and the rate of interest charged, security required and lending procedures vary widely. In developing countries like Nigeria, most of the credit needs of small farmers are provided by the informal lenders,

while those of the larger farmers tend to be met by the formal lenders.

2.8 Other Useful Hints

1. Loans in Cash and Kind

It is commonly recommended that loan to small farmers should be given in kind instead of cash. This is to avoid diversion of the credit to other uses. Therefore, it is recommended that loans for fertilisers, pesticides and improved seeds should be given in kind.

Loans in kind are of limited value to the small-scale farmers since the major use of the credit may be for payment of hired labour. In the sub-section under use of credit, it was highlighted that hired labour accounts for 60-70% of the total credit for small farmers. Therefore, if loans are given in kind, the most important area of need of the small farmers will not be met. Another problem is the fact that small farmers may collect fertilisers and other inputs and sell them at give-away prices in order to get money for other things. When this happens, the purpose of giving loan in kind would have been defeated.

2. Repayment Plan

Any of the loans enumerated in the four classes can be grouped according to repayment plan. That is, short-term loans may be paid back in lump-sum, which is sometimes called end payment. This happens when the borrower pays back the amount borrowed and the interest at the end of the borrowing period. It could also mean that the borrower would pay the principal by monthly instalment and also pay the interest at the end of the period.

The second is when the loan is a long-term one. In this case, the repayment of the principal and interest is done by instalment. This is known as amortisation. For example, if Mr. John borrows ₦1,000,000.00 from the bank for 10 years at 20% interest rate, the first thing to be done is to calculate the interest rate which is ₦200,000.00 for the first year. What he will pay back in the first year is ₦100,000.00 for the capital, but for interest it will be ₦200,000.00. These sum up to ₦300,000.00. The second year capital is ₦900,000.00. The second 20% yearly payment of capital is ₦200,000.00 while the interest is ₦180,000.00. This brings the total second year payment to a sum of ₦280,000.00. The repayment sum will continue to decrease till by the final year the whole capital sum and interest are fully paid up.

3. Lending Institutions

The important role played by lending institutions in macro finance has been outlined above. Selecting the proper lender is of paramount importance in the success of a farm business. If a farmer selects a top-notch lender and cooperates fully with him, he has materially improved his odds for success. A well-educated lender with adequate experience who keeps the borrower informed on current developments can be of immeasurable value to a farmer. Through wide and varied contacts and study, such a lender develops an understanding and basis for judgment which the individual farmer working within confines of his own business cannot hope to develop. Such a lender serves as a balance wheel, cautioning the farmer against excesses or over enthusiasm, and limits expansion to safe bounds dictated by repayment capacity and risk-bearing ability. At the same time, he encourages the farmer to accept fruitful opportunity, stimulates expansion which is profitable and sound, and counsels with the farmer on adjustments in the business so that every naira will be used where it will produce the maximum return. Financing plans developed in cooperation with such a lender have real value to the farmer.

In order to make an intelligent choice among lenders, the farmer must know the lender's "pedigree" and record. The "pedigree" of a lender is indicated by such things as the type of financing institution, personnel who operate the institution, and its loan and service policies. The record of a lender is indicated by the way he has helped others in the community. The farmer should obtain information about each lender and, on the basis of facts learned, decide which can give him the credit service best fitted to his particular needs. A study of the various types of lending institutions comprises a basic part of the study of agricultural finance and becomes of increasing importance as capital and credit requirements of agriculture expand.

2.9 Summary

In this unit, you have learnt about classifying credit by length of time of repayment, purpose of use, on basis of security and by lenders' policies.

You have also learnt that:

- production credit is dynamic because it has potential to increase the farmer's income;
- consumption credit on the other hand is static and farmers may have more difficulty in paying back;

- in the time classification, credit is classified into three groups – short-term, intermediate-term, and long-term – according to the term of the loan;
- purpose classification groups loans according to the purpose of the loan, with subclasses based upon specific uses of the funds e.g., production, real estate, commodity storage etc.;
- loans classified on security basis are of two types - secured and unsecured. Unsecured loans are an unsecured credit based solely on the good reputation of the borrower. Secured loans are those secured by movable assets such that if the borrower fails to pay back when the loan is due, the property may be taken over by the lender; and
- lender classification is based on policies of lenders which differ greatly.

2.10 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press, Ames.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

2.11 Possible Answers to Self-Assessment Exercise(s)

The distinction between short, intermediate, and long-term credit coincides with a difference in loan purpose. Short-term loans are generally used for the production of farm crops and livestock; intermediate-term loans are generally for working-capital assets like machinery; and long-term loans are frequently for the purchase of a farm. A classification of credit according to purpose brings out this close relationship between time and purpose.

Unit 3 Importance of Credit to the Farmers and the Role of Credit in Agricultural Development

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Importance of Credit to the Farmers
- 3.4 Essential Conditions Necessary for Credit to Facilitate Agricultural Development
- 3.5 Advantages of Efficient Credit Programme
- 3.6 Roles Credit can Play to Facilitate Agricultural Development
- 3.7 Summary
- 3.8 References/Further Readings/Web Resources
- 3.9 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

Some scholars argue that lack of credit in sufficient quantity is a major constraint to agricultural development. They rest their argument on the fact that the adoption of most technologies involves the purchase of improved inputs. In the previous section, it was mentioned that most farmers in developing countries are poor, thus they do not have the financial resources to purchase such inputs and the indigenous credit system cannot supply the needed credit on acceptable terms. Consequently, the lack of credit becomes a major constraint for agricultural development.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain the importance of credit to the farmer
- explain the essential conditions necessary for credit to facilitate agricultural development
- discuss the roles of credit to agricultural development.

3.3 Importance of Credit to the Farmer

Credit can help improve the farmers' situation in the following ways:

1. **Protection against adverse conditions**
The use of credit can assist the farmer to face adverse weather, disease conditions and price uncertainties in farming. While it is virtually impossible to eliminate all forms of risks in farming, credit can play a major role in protecting the business from financial failure or liquidation when adverse conditions occur.
2. **Meeting seasonal and annual fluctuation in income and expenditures**
Inputs must be purchased in one period and products are sold later in the year with very little cash inflows and outflows occurring at the same time. Using credit to smooth out these fluctuations and so match cash inflows and outflows is essential to efficient operation.
3. **For production purpose**
This may be to buy inputs such as seeds, fertiliser, tractors, chemicals etc.
4. **Increase Efficiency**
The use of credit makes it possible to substitute one resource for another. For example, machinery might be substituted for labour as a means of reducing cost, improving timeliness and increasing the efficiency of the farm business.
5. **Adjust to changing economic conditions**
New technological development or changing market conditions may require major adjustment. For example, change from one enterprise to another may require major capital investments.
6. **To meet unproductive purpose**
Any credit in possession of the farmer can come in handy for meeting expenses such as marriages, children's school fees, funerals, festivals, clothing and feeding the family.

3.4 Essential Conditions Necessary for Credit to Facilitate Agricultural Development

Some other set of scholars argue that it is not the lack of credit that limits the modernisation of agriculture but the absence of the other "essentials" that are necessary for development. Extending credit to the small farmers who do not have ability to use it profitably could be a disservice. The farmers will only acquire a debt obligation without any concomitant increase in income with which to repay. Most of them may spend such credit on consumption purposes instead of production purposes. The lending institutions, on the other hand, will be burdened with collection problems.

The essential conditions are that:

- (i) agricultural research must have developed improved technologies which are clearly superior to the traditional methods
- (ii) farmers must have seen practical demonstration of the new technologies, understand and willing to use them
- (iii) farmers must have confidence that the fertilisers, seeds, pesticides and other equipment needed to adopt the new practice will be available in the villages at the proper time and in the amount required
- (iv) the necessary credit to purchase these inputs will be made available at the required time and
- (v) farmers have been assured that there will be market for the extra production at reasonable market prices
- (vi) An efficient credit programme is put in place which include:
 - adequate amount of credit
 - credit availability at the right time
 - credit availability at affordable rate of interest
 - credit availability at favourable repayment conditions
 - credit availability for the desired farm operations
 - credit availability with minimal bureaucratic procedures.

Self-Assessment Exercise 1

1. How does credit help the farmer to guard against adverse conditions?

3.5 Advantages of Efficient Credit Programme

- Farmers face less debt obligation burdens
- Less difficult collection problems for the lender
- Higher rates of repayment
- Less credit diversion
- Less default rates.

3.6 Roles Credit can Play to Facilitate Agricultural Development

If profitable technologies exist and farmers are aware of their values:

- adoption by small farmers will be enhanced by available credit for purchasing the improved inputs that are needed
- farm operations will be timely conducted by farmers
- hired labour can be easily accommodated by the farmers

- increased yield will be experienced by the farmers
- increased profit from each enterprise
- savings will increase on the part of farmers
- expansion in production and productive capacity over time
- increased food availability for the populace
- increase in raw materials for local manufacturers and processors
- reduced food importation
- exportation of farmers' products will be enhanced hence increase in foreign exchange generation
- improvement in standard of living of the populace.

Self-Assessment Exercise 2

1. Mention at least 5 advantages of efficient credit programme.

3.7 Summary

You learnt that there are some essential conditions that need to be fulfilled for credit to have positive impact on agricultural development. If these conditions are fulfilled, availability of credit facilitates adoption of improved technologies that pave way for agricultural development.

In this unit you have learnt that it is essential for:

- Research to have developed proven superior improved technologies in which farmers' confidence have been fully ascertained.
- The necessary inputs for these technologies are available at the farmers reach.
- The credit facilities are in place for farmers to purchase them and that farmers are assured of markets for their produce.

It is only then that the use of credit can perform the following roles:

- Adoption of improved technologies
- Generate savings
- Generate further investment in agriculture
- Improve standard of living of the farming families.

3.8 References/Further Readings/Web Resources

Lee, W. *et al.* (1988). *Agricultural Finance*. Kalyani, New Delhi.

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

3.9 Possible Answers to Self-Assessment Exercise(s)

Self-Assessment Exercise 1

The use of credit can assist the farmer to face adverse weather, disease conditions and price uncertainties in farming. While it is virtually impossible to eliminate all forms of risks in farming, credit can play a major role in protecting the business from financial failure or liquidation when adverse conditions occur.

Self-Assessment Exercise 2

- Farmers face less debt obligation burdens
- Less difficult collection problems for the lender
- Higher rates of repayment
- Less credit diversion
- Less default rates.

Unit 4 Farm Records Keeping for Financial Decision Making

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Importance of Keeping Farm Record
- 4.4 Types of Farm Record
- 4.5 Summary
- 4.6 References/Further Readings/Web Resources
- 4.7 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

One of the factors which distinguishes commercial from peasant farming is the deliberate effort on the part of the farm operator to keep records and accounts of his farm operations. It is an undisputable fact that the backbone of any business organisation aiming at maximising profits is a well organised system of records keeping and accounting. The need to keep records and accounts of farm business activities becomes increasingly necessary as agriculture moves from subsistence to market-oriented production under peasant agriculture. The need to keep records and account hardly arises because farm production activities are geared primarily towards meeting subsistence needs of the farm family which invariably supplies the bulk of factors of production employed on the farm.

However, under commercial agriculture, the need to keep written records and accounts become clearly manifest because farm business operations are undertaken with the motive to maximise profit by using a wide variety of resources which are traded in the market, since the farm operator has to deal with large volumes of financial transactions, he cannot possibly rely on his memory for keeping farm records and accounts. For planning and decision-making purposes, he has to keep written records and accounts of all business undertaken on his farm.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- identify the basic importance of keeping records
- identify the types of record we keep on the farm.

4.3 Importance of Keeping Farm Record

1. Farm management decision making

The farm is usually laced with management decisions such as: What to produce? When and how much to produce? What combination of inputs to use, for whom to produce, etc.? In taking these decisions, farm records and accounts when kept for a length of time are a useful guide to the farmer in determining what each enterprise is adding to the farm income as well revealing where his relative advantage lies. Apart from allowing the farmer to measure his efficiency in using resources such as land, labour and capital for producing agricultural products for sale, farm records enable him to check whether things are going wrong so that he can quickly put them right before they result in big losses. Another way in which farm records and accounts are very useful to farm management decisions lies in planning the organisation (re-organisation) of farm enterprises in advance. An examination of a given farm records and accounts over a period of years provides a basis for formulating future plans (e.g. budgeting). Because of variations across different farms in terms of differences in management abilities, climatic conditions, soil types, availability of labour and credits etc., data generated on a given farm will be much more reliable than local averages for formulating such plans.

2. Performance evaluation

By proving a history of what is happening on the farm from one period to the other, farm records and accounts enable the farmer to determine whether he is making progress or not. By comparing any year's records and accounts with those of the other years, a farmer can see whether his yields and profits are increasing or decreasing. Furthermore, he will be able to compare his achievements in terms of yields and profits with those in his plans as well as with those of similar farms in the neighbourhood. Such comparisons can lead to identifications of possible weaknesses and the ways of overcoming them. Farm records and accounts also enable the farmer to know his farm's financial position at a given time period. The knowledge of the extent of his liabilities in relation to possible returns is very important to avert financial loss and/or bankruptcy. By showing the farmer how much he is earning, farm records and accounts can make the farmer adjust his personal expenditures to the income arising from his farm business.

3. Credit purpose

Good and accurate farm record-keeping and accounting provide an important basis for granting credit by financial institutions world-wide. According to the American Bankers Association (1965) the banker who has records of the borrower's business is able to compare the borrower's past performance against standards in the area. They pointed out that records also become a basis for projecting and evaluating the future profitability and loan repayment capacity of the business and that record properly and accurately kept, provide the banker with the financial information needed for prompt handling of credit requests. A farmer who keeps proper records and accounts of his farm business and who wishes to negotiate with his bank or with any other financial institutions for a loan to expand his business is likely to be given a better audience than the one who has only a vague idea of the economic situation of his farm business. Thus, lack of accurate records and accounts by small farmers can make it difficult for bank to extend credit facilities to them. It is agreed that it is a dis-service to extend credit to a farmer who has no records and accounts to show that by using credit, he can make additional money to repay the loan as at and when due and leave a profit for himself. Such a farmer thereby acquires a debt obligation without any concomitant increase in income with which to repay it while the lending institution is saddled with a recovery problem.

4. Taxation and insurance purposes

One of the civil responsibilities of an adult (including the farmer) is the payment of his tax which is one of the sources of revenue to the government. On the other hand, a farm insurance policy is undertaken by a farmer to pay a premium (agreed sum of money) to an insurance company willing to undertake the risks of a possible loss on the insurance property and/or enterprises of a total loss on the insured item by receiving some compensation (indemnity) from the insurance company in the event of a loss or damage. However, lack of reliable records and accounts does not permit accurate assessments of farmer's annual net farm incomes in Nigeria. The results, of course, are that some farmers are paying more taxes while many others are paying less taxes than the amounts they are liable.

5. Provision of National Agricultural and Economic Planning Data

There is no gainsaying the fact that adequate and reliable data are essential for both agricultural and overall economic planning in any economy. For this purpose, farm records and accounts

provide the much-needed data for meaningful and attainable agricultural plans both at the local, state and national levels. For example, budgetary allocation of funds for the purchases of farm inputs, such as machinery and fertilisers, requires knowledge of the demand for these inputs. However, to be able to estimate the demand for machinery and fertilisers data on number of farmers, the level of their farm incomes, machinery hours employed, quantity of fertilisers used, hectares of land under different types of crops etc. must be known. Thus, lack of adequate and accurate farm records and accounts explain why Nigeria has found it difficult to formulate workable agricultural and economic plans.

Other areas where records and accounts could be useful to the farmer are in making leases or sales, assessing for compensation and in the settlement of an estate on the death of the farmer. Well- kept farm records and accounts provide great assistance to value in determining the value of the business and compensation payable.

Self- Assessment Exercise 1

1. Explain the role of keeping farm records in farm management decision making.

4.4 Types of Farm Record

There are a number of ways of categorising farm record and account. However, categories which a farmer adopts depend on the types of information he wants to keep. For our purpose, five types of record will be discussed. These are:

1. Inventory records.
2. Production records.
3. Farm receipts records.
4. Payroll/labour records.
5. Farm operation records.

Inventory records

An inventory refers to the complete count and evaluation of all assets and liabilities on the farm at a specified date. "Assets" in this context refers to all materials, i.e., goods and services owned by the farmer and used in the production process. Liabilities, on the other hand, refer to goods and services which the farm owes to others. An inventory record of a farm is important for a number of reasons. Firstly, it shows the net worth of the farm at a point in time as well as the stocks such as feeds,

medicines etc. on hand. Secondly, it records the expenses due to depreciation.

There are two steps in taking an inventory count and evaluation first; there is a physical count of the assets and liabilities (physical records). This involves a simple listing of the assets and liabilities of the farm. The list could be in the form of land in hectares, including what crops are on what hectares, buildings and what the building are used for; fences and permanent improvements on land such as dams, terraces etc., other assets that should be listed include machinery and equipment such as tractors and their implements, cutlasses, hoes baskets etc.; supplies such as chains, ropes, fertilisers, seeds, medicines as well as gasoline.

It is also necessary to take note of the stage of maturity of crops standing on the field as well as crops in stock (i.e., crops harvested but not yet sold) (and whether the crops are shelled or milled or processed to any form).

A physical count of livestock should include the type and class of livestock, the age, sex, as well as the number and weight, if possible. Normally, animals are lumped together and the total or average weights taken, but valuable bulls, dairy cows and breeding stock should be listed individually.

The second step in taking an inventory is the valuation of the assets and liabilities already listed, using appropriate methods.

Usually, inventory records are taken at the beginning and at the end of the year. As a rule, the same price must be used to value the assets and liabilities listed each time so that only real changes are accounted for. Changes in inventory values between the beginning and end of the year may be due to one or a combination and changes in market conditions.

Apart from being very useful in appraising a farm business, farm inventory records are useful in preparing the farm income statement, farm trading accounts and the farm balance sheet.

Assets could be classified into fixed, working and current assets while liabilities are usually classified into long-term, medium-term and current liabilities. The classifications are however, not full-proof as the decision as to which class to put a particular asset or liability depends on some degree on the farmer or farm manager.

Nevertheless, there are some assets and liabilities that fit neatly into the classes. Fixed assets are those with a long life and which are practically impossible to convert to cash to meet short-term or current obligations. They include the building, land permanent improvement; dairy cattle

breeding and other working assets are those which can within relatively short time be converted into cash. They include seeds feeds supplies as livestock. Harvested crops in storage that are classified as working assets are those that can be used immediately in production such as cash and account receivable. Other assets that can be easily converted to cash, such as milled rice or threshed maize are current assets.

Long-time liabilities include mortgages which take a long time to liquidate and other long-time debts. Medium-term liabilities refer to debts due for repayment say within 2.3 years (Medium-term liabilities include debts incurred on the basis of crops in the process of production or poultry and other livestock which will be ready for sale within the production seasons. They are debts incurred based on a medium-term ability to repay). Current liabilities are debts that are due for payment or that will be due for payment within a very short period.

Production records

These are records of the payment of both crop and livestock outputs produced together with the corresponding quantities of inputs used. Examples are record of area of land under different crop, quantities of inputs used and outputs harvested. Livestock record should include number, age, weight and mortality as well as the quantities of feed, various types of livestock in case of poultry enterprise. Such records should include number of birds, quantities of feed fed, weights and number of eggs laid per day.

Farm receipt records

A profit-oriented farmer should obtain receipts for all items purchased for his farm business and issue receipts for all items sold on the farm and keep them religiously. In addition, he should properly document all accounts payable to others and receivables by his business. Doing these, he will be able to have an accurate picture of all expenditures and incomes of his farm business at the end of the year.

Finally, the farmer should include the value of the farm produce consumed by his household and/or given as gifts as part of the farm income. The naira value of farm produce consumed and/or given to others can be determined by using relevant market prices to value each output.

Payroll/labour records

These should contain information such as the category of workers employed, date, work done, number of days worked and wage rate including payment in kind. Other aspects of the labour record which should also be documented are the amount of labour input supplied by members of farm household, categorised into adults and children. Such a

record should contain the number, sex and number of days worked by household members during the year. The contributions of family labour (in monetary terms) can be estimated by:

- (a) estimating total man-days of family labour after making necessary adjustments to convert the work done by non-adult and female members of household to adult-equivalents and
 - (b) multiplying total man-class obtained in (a) above by the current wage rate.
- Amount, both physical and naira value of labour used each season of the year and
 - Amount of labour used for each farm enterprise.

Farm operation records

Major farm operations on which proper records should be kept include land clearing and preparation, planting, weeding (manual, chemical or mechanical), fertiliser application and harvesting. The records should show the number of man-days and/or machinery hours employed by each operation as well as the date operations were carried out. Also, necessary for documentation in such records are the types of labour and machine for each operation.

Self-Assessment Exercise 2

1. What do you understand by farm production record?

4.5 Summary

In this unit, you have learnt:

- The importance or roles of keeping farm records.
- The types of farm records.

Further in this unit, you have also learnt that keeping farm records enables a farmer to develop the farm as per the modern recommended requirements for the farm to be commercially viable. The farmer is able to gather important information concerning the farm which helps him to make important decisions on the future plans on the development of the farm.

4.6 References/Further Readings/Web Resources

Castle, E. N., Becker, M. H. & Smith, F. I. (1972). *Farm Business Management*. New York: The MacMillan Company.

Olukosi, J. O. & Erhabor, P. O. (2012). *Introduction to Farm Management Economics: Principles and Applications*. Nigeria: AGITAB Publisher Ltd. pp. 21-34.

4.7 Possible Answers to Self-Assessment Exercise(s)

Self-Assessment Exercise 1

The farm is usually laced with management decisions such as: What to produce? When and how much to produce? What combination of inputs to use, for whom to produce etc.? In taking these decisions, farm records and accounts when kept for a length of time are a useful guide to the farmer in determining what each enterprise is adding to the farm income as well revealing where his relative advantage lies. Apart from allowing the farmer to measure his efficiency in using resources such as land, labour and capital for producing agricultural products for sale, farm records enable him to check whether things are going wrong so that he can quickly put them right before they result in big losses. Another way in which farm records and accounts are very useful to farm management decisions lies in planning the organisation (re-organisation) of farm enterprises in advance. An examination of a given farm records and accounts over a period of years provides a basis for formulating future plans (e.g. budgeting). Because of variations across different farms in terms of differences in management abilities, climatic conditions, soil types, availability of labour and credits etc., data generated on a given farm will be much more reliable than local averages for formulating such plans.

Self-Assessment Exercise 2

These are records of the payment of both crop and livestock output produced together with the corresponding quantities of inputs used. Examples are record of area of land under different crop, quantities of inputs used and outputs harvested. Livestock record should include number, age, weight and mortality as well as the quantities of feed, various types of livestock in case of poultry enterprise. Such records should include number of birds, quantities of feed fed, weights and number of eggs laid per day.

Unit 5 Farm Accounts for Financial Management

Unit Structure

- 5.1 Introduction
- 5.2 Intended Learning Outcomes
- 5.3 Farm Accounts for Financial Management
- 5.4 Summary
- 5.5 References/Further Readings/Web Resources
- 5.6 Possible Answers to Self-Assessment Exercise(s)

5.1 Introduction

Farm accounting involves maintaining and using records and other information needed to measure the financial performance of the business. A farmer cannot possibly make intelligent decisions regarding the current use of capital unless adequate information regarding the current financial condition and past progress of the operation is at hand.

5.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- identify the principles of keeping farm accounts
- explain the importance of keeping farm accounts.

5.3 Farm Accounts for Financial Management

Farm accounts for financial management is concerned with production costs: accounting that is concerned with providing detailed information on the cost of production of farm produce or carrying out an operation in farm business. The following are what should be considered in farm accounts management.

1. Serviceability

Financial accounts are meant to serve the business and legal needs of the management of a business enterprise. Since the introduction of a new record or account involves additional expenses, a new record should be added only if it has a prospective benefit which is greater than the opportunity cost of introducing it.

2. Objectivity

Financial report should show facts which could be supported by concrete evidence of complete transactions. Such as invoices,

cheque, contracts etc. Also, such report should be unbiased and be verifiable by independent investigators such as auditors.

3. Materiality principle

Materiality principle states that only assets which have some significance should be included in accounts i.e. assets which have a purchase price over some specified amount. For instance, while depreciation values on assets such as vehicles and equipment are included in the accounts, depreciation values on assets such as pencils and erasers are not; because the amounts involved are very small compared to the opportunity cost of depreciating them.

However, determining what is and what is not material to the accounts of a business is a matter of judgment.

4. Conservatism

This simply cautions against being over optimistic when values of assets, depreciation rates etc. are being determined. When valuing assets for accounting purpose, the lowest of the three values i.e., historical cost, replacement cost or net realisable values of an asset unit is actually realised.

5. Disclosure

This requires that full supplementation of pure numerical recordings and tabulations with explanatory footnotes and comments be made.

6. The going concern

It is assumed that the business entity will continue its activity indefinitely. Thus, only the cost of assets paid by the entity is considered. The business will have continuous use of the assets for the purpose for which they were acquired. Any deviations from this will be completely identified and clearly explained.

7. Consistency

This states that the basis for valuing assets and fund for measuring profits should be consistent from one period to the other. This is necessary to make comparisons between the accounts of one year and another more meaningful.

8. Cost as basis of valuation

This states that assets should be valued in a balance sheet at what they cost and not at what they are worth if they were sold at going market value. Cost includes incidentals such as transportation, installation etc. Where there are two alternatives

for value such as in a trade fair or a gift, the price selected should be the more reliable estimate of the "fair" market price.

9. Duality principle

This considers every business transaction as having a dual aspect i.e. "giving" and "receiving" which must be reflected in the accounts. For example, when a business purchases an asset, it will be "giving" cash and "receiving" the asset.

This principle is fundamental to double-entry system of credits and debits which is the basis of most modern book-keeping.

10. Stable Monetary Units

This assumes that general price level remains reasonably constant. Since the primary purpose of accounting is measurement of income and business worth, there must be some stable measuring unit.

11. Realisation of revenues

This states that revenues are realised when market place transactions increase the owner's equity and should not be recorded until that time.

Self- Assessment Exercises

- | |
|--|
| <ol style="list-style-type: none">1. Define farm account for financial management.2. What is duality principle? |
|--|

5.4 Summary

In this unit, you have learnt:

- the basic principles of farm accounting.
- importance of each of these principles in the compilation of financial records such as the balance sheet, income statement or profit and loss statement.

You have also learnt the basic principle of farm accounting which guides us in the compilation of the financial records and valuations of assets.

5.5 References/Further Readings/Web Resources

Castle, E. N., Becker, M. H. & Smith, F. I. (1972). *Farm Business Management*. New York: The MacMillan Company.

Olukosi, J. O. & Erhabor, P. O. (2012). *Introduction to Farm Management Economics: Principles and Applications*. Nigeria: AGITAB Publisher Ltd.

5.6 Possible Answers to Self-Assessment Exercises

1. Farm accounts for financial management is concerned with production costs: accounting that is concerned with providing detailed information on the cost of production of farm produce or carrying out an operation in farm business.
2. **Duality principle**
This considers every business transaction as having a dual aspect i.e. "giving" and "receiving" which must be reflected in the accounts. For example, when a business purchases an asset, it will be "giving" cash and "receiving" the asset. This principle is fundamental to double-entry system of credits and debits which is the basis of most modern book-keeping.

MODULE 2 BASIC ECONOMIC PRINCIPLES FOR AGRICULTURAL FINANCE

This module is intended to provide an introduction to basic economic principles essential to an understanding of principles of finance. The economic principles form the basis for making decisions relative to financing the farm business. They provide a framework for deciding the enterprise to be included in the business, the relative amounts of various factors of production to be employed in each enterprise, and the total amount of capital to be used in the business. When the borrower has a good knowledge of economic principles, he will be able to compare various sources of finance and determine the amount of capital to be utilized from each source.

These principles are by no means peculiar to finance or any other particular aspect of the farm business. They are universally applicable in all aspects of management though their applications vary. When a farm manager wants to borrow funds to finance the purchase of a piece of equipment, he uses economic principles. When he wants to dispose of a piece of equipment, he uses economic principles. When his own equity cannot allow him to enlarge his business he needs to borrow from some other sources. He will be guided by economic principles on how much to borrow, when to borrow, from whom to borrow, how to allocate his own equity and borrowed funds to achieve his objectives. This module cannot cover all economic principles but to focus attention on those that are crucial for the study to understand the elements of financial decision making.

Unit 1	Input-Output Relationships (Law of Diminishing Returns)
Unit 2	Input-Input Relationships
Unit 3	Product-Product Relationships
Unit 4	Principles of Equi-marginal Returns and Opportunity Cost
Unit 5	Law of Comparative Advantage
Unit 6	Cost Functions

Unit 1 Input-Output Relationships (Law of Diminishing Returns)

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Law of Diminishing Returns
- 1.4 Diminishing Economic Returns
- 1.5 Principle of Marginalisation
- 1.6 Summary
- 1.7 References/Further Readings/Web Resources
- 1.8 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

In the production process, inputs are converted into outputs. Whatever is put into the production process come out as output. There is therefore a relationship between the input (used) and the output (the final outcome). Generally, a function states the relationship between variables. In production economics, the most fundamental relationship is that between the factors of production and the product.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define the law of diminishing returns and its decision rules
- determine the most profitable level of production
- determine the quantity of input needed to maximise profit
- describe principle of marginalisation and its decision rules.

1.3 Law of Diminishing Returns

One of the most important principles in economic analysis is the Law of Diminishing Returns. The law forms the framework for marginal analysis which is the most powerful tool in economics. The law of diminishing returns refers to the amount of additional output obtained as additional inputs of variable factors of production are added to a set of fixed number of other factors. In its simplest form, it is expressed as follows: with one factor of production held constant or fixed, the additional output derived from each additional unit of a variable factor declines after a certain level of variable factor used has been attained.

In a study conducted by Olukosi (1972) the estimated production function is shown in equation (1) as follows:

$$Y = 45.1498 + 1.1771N - 0.0038N^2 \dots\dots\dots (1)$$

Where Y = yield of maize in kilograms

N = quantity of nitrogen in kg

The values of Y are tabulated by substituting 10 successive equal units of N into the equation. For example, when N = 10;

$$Y = 45.1498 + 1.1771(10) - 0.0038(10)^2$$

$$Y = 56.55 \text{ kg when } N = 20;$$

$$Y = 67.17 \text{ kg}$$

This is done till the level of N = 250 kg which gives the Y value to be 101.92 kg, is reached. When the values of Y are plotted against the corresponding values of N, the graph in Figure 1 is obtained.

The law of diminishing returns can now be illustrated by observing that Y increases from 45.15 to 136.21 kg when N = 150 kg. But an additional increase of N kg 10 units to 160 kg results in a decrease of Y to 136.20 kg.

The marginal yield (column 4, Table 1) depicts the picture more vividly. The marginal yield is the additional yield obtained as a result of an additional unit of N. The marginal yield values are calculated between the yield figures (the present and the previous). It is given by

$$\text{Marginal yield of maize} = \frac{\text{Change in yield of maize}}{\text{Change in N applied}}$$

Table 1.1: Total, Average and Marginal Yield of Maize under Nitrogen Application

Kgs of nitrogen	Kgs of maize	Average yield	Marginal yield
0	45.15	-	
10	56.55	67.17	5.65
20	77.04		3.36
30	86.15		2.57
40	94.50		1.063
50	102.09		0.987
60	108.93		0.911
70	115.00		0.835
80	120.31		0.759
90	124.86		0.684
100	128.65		0.607
110	131.68		0.531
120	133.95		0.455
130	135.46		0.379
140	136.21		0.303
150	136.20		0.227
160	135.43		0.151
170	133.96		0.075
180	131.62		0.075
190	128.56		-0.01
200	124.76		-0.078
210	120.19		-0.147
220	114.86		-0.234
230	108.77		-0.360
240	101.92		-0.380
250			-0.457

Source: Olukosi, J. O. (1972). Production functions, and economic optima for corn and grain sorghum under fertilisation and irrigated experimental plot in West-Central Kansas. M.Sc. Thesis, Department of Agricultural Economics, Kansas State University, Manhattan, Kansas, U.S.A.

When N increases from 0 to 10 units; the change is $10 - 0 = 10$

When yield of maize increases from 45.15 to 56.55, the change is $(56.55 - 45.15) = 11.40$

The marginal yield at that level is $\frac{11.40}{10} = 1.14$. Further observations of the figures in column 4 show that the values decrease with successive additions of the N up to a point when it becomes less than zero. Since the marginal yield is the increase in the yield of maize due to an equal increase in level of N, it means the yield is increasing but at a decreasing rate. This is the crux of the matter – Diminishing Return! When the increase of Y is zero i.e. yield reaches a peak where the marginal yield

(MPP) is zero. Further addition of units of N will result in negative marginal yield meaning that the yield of maize decreases.

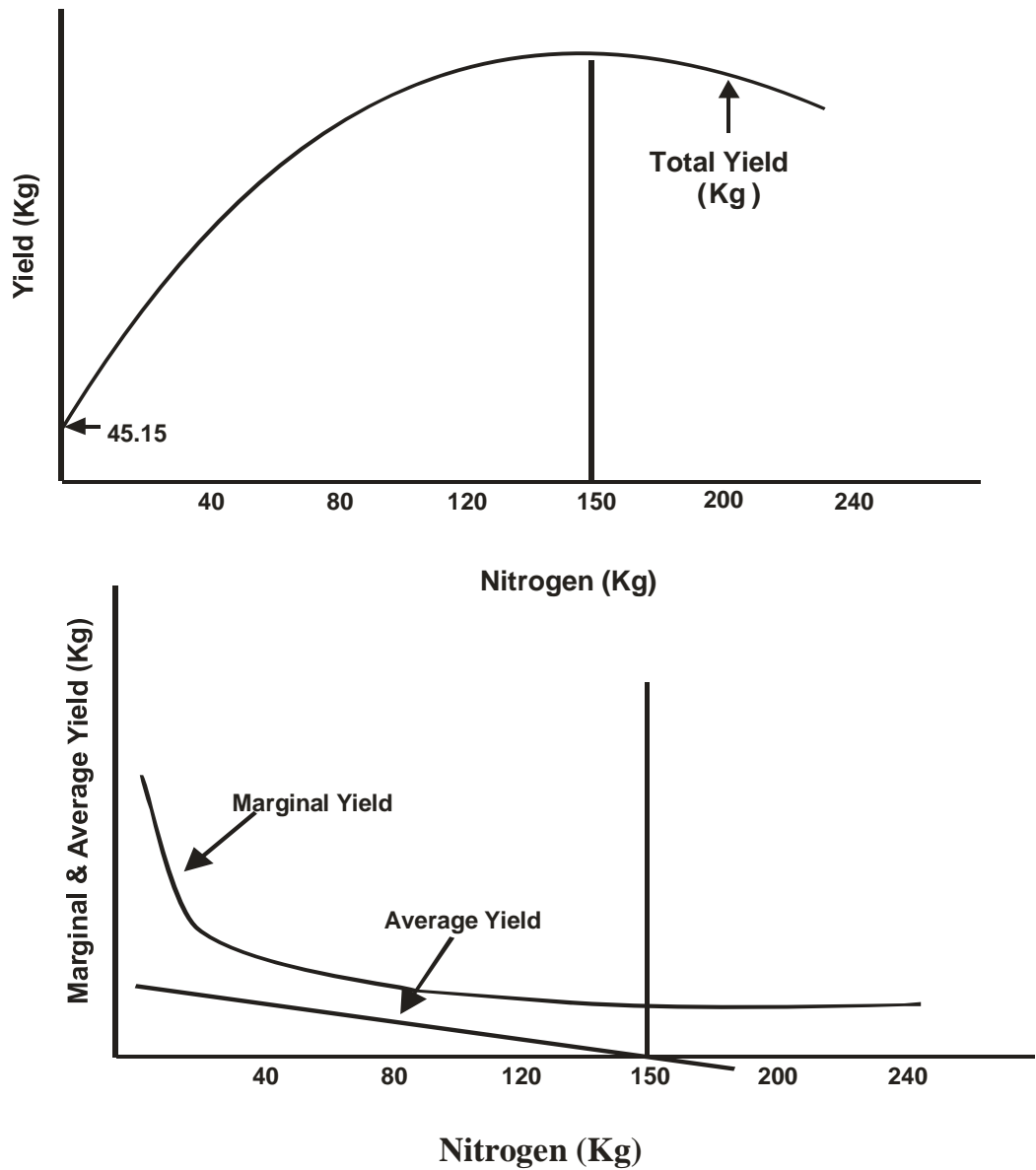


Fig 1.1: Total, Marginal and Average Yields of Maize

Figure 1.1 shows both the total yield and the marginal yield. The average yield is given by:

$$\frac{\text{Yield of maize (kg)}}{\text{Quantity of N (kg)}}$$

When yield of maize is 56.55 kg at N = 10 kg, the average yield is $56.55 \div 10 = 5.65$. The shape of the average yield is also shown in Figure 2.

In the example above, the land is assumed fixed, and the levels of phosphorus (P) and potassium (K) are assumed fixed while nitrogen (N) is the only variable factor. There are other cases when there can be more than one variable factor. For example, if P and K are increased along with N, total production would likely increase to a considerably greater extent. This means that additional production associated with successive applications of the bundle of variable inputs would not decline so much.

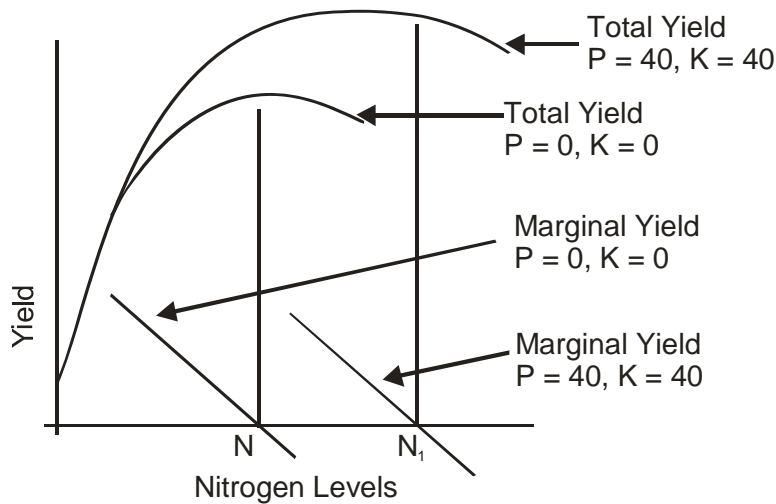


Fig. 1.2: Production Functions with Potassium and Phosphorus Fixed

As depicted in Figure 1.2, the level at which the total yield curve reaches its peak will be at a higher level of N (N_1) when $P = 40$; $K = 40$ compared to (N) when $P = 0$; $K = 0$.

1.4 Diminishing Economic Returns

The principle of Diminishing Returns has economic significance since most of the factors of production and products produced have economic value. By converting the physical data to monetary terms, diminishing economic returns are portrayed. Comparing these returns with the costs involved provides the basis for determining whether production is profitable and, if so, the level of production which will maximise returns.

The nitrogen fertilizer example discussed above is expanded in Table 1.2 to portray costs and returns in addition to physical data. If the bundle of fixed factors cost ₦1000 and each unit of N fertilizer costs ₦50 per kg and the maize grain produced was priced at ₦35 per kg.

The total value of output (column 11) obviously increases at a decreasing rate, the same as the total physical output (Column 7).

Similarly, the value of additional (marginal) output (column 13) follows the same pattern as the additional (marginal physical output (column 9)).

Decision Rules

The Law of Diminishing Returns provides the basis for determining whether production is profitable and, if so, the level of production which will maximize returns. As can be seen in Table 1.3, the (additional cost of producing an additional unit of output, called MC) is about equal to the additional (marginal) value of the product (called MVP) at the level of 50 kg of nitrogen. This is where profit is maximised i.e. where $MVP = MC$ i.e. value in bold in columns 6 and column 13. The exact quantity of nitrogen to apply to maximise profit lies between 50 and 60kg per hectare of nitrogen though very close to 50kg. The quantity of output that makes the maximum profit possible is about 5670kg of maize. The exact quantity will be between 5670 and 6125 but much closer to 5670 (see col. 11). From farm financial management point of view, every additional unit of input increases the financial commitment to the business. Each unit of input results in some unit increase in financial cost since the input is not free. If it were free (i.e. price of N = 0) the level of produce will be where TPP is at its peak.

Table 1.2: Costs and Returns Related to Diminishing Returns in Maize Production

Input		Cost of inputs				Output			Value of output			
Fixed factor	Variable input: Nitrogen	Fixed Factor	Variable factor	Total cost	Additional cost	Kg	Average yield	Additional marginal yield per unit of Nitrogen	Per kg	Total	Average per unit of fertilizer	Additional marginal value
1	2	3	4	5	6	7	8	9	10	11	12	13
	No. of units)	(₦)	(₦)	(₦)	(₦)							
	0	1000	0	1000		45.149	-		60	2709	-	
	10	1000	500	1500	500	56.54	5.65	1.139	60	3392	339.2	683
	20	1000	1000	2000	500	67.17	3.36	1.063	60	4030	201.5	638
	30	1000	1500	2500	500	77.04	2.57	0.987	60	4627	154.1	34.2
	40	1000	2000	3000	500	86.15	2.15	0.911	60	5169	129.2	54.7
	50	1000	2500	3500	500*	94.50	1.89	0.835	60	5670	113.4	501*
	60	1000	3000	4000	500	102.09	1.70	0.759	60	6125	102.1	455
	70	1000	3500	4500	500	108.93	1.56	0.684	60	6536	93.4	411
	80	1000	4000	5000	500	115.06	1.44	0.607	60	6900	86.3	364
	90	1000	4500	5500	500	120.31	1.34	0.531	60	7219	80.2	319
	100	1000	5000	6000	500	124.86	1.25	0.455	60	7492	74.9	273
	110	1000	5500	6500	500	128.65	1.17	0.379	60	7719	70.2	227
	120	1000	6000	7000	500	131.68	1.09	0.303	60	7901	65.8	182
	130	1000	6500	7500	500	133.95	1.03	0.227	60	8037	61.8	136
	140	1000	7000	8000	500	135.46	0.97	0.151	60	8128	58.1	91
	150	1000	7500	8500	500	136.21	0.91	0.075	60	8173	54.5	45
	160	1000	8000	9000	500	136.20	0.85	-0.01	60	8172	51.1	-1
	170	1000	8500	9500	500	135.43	0.80	-0.078	60	8123	47.8	-49
	180	1000	9000	10000	500	133.96	0.74	-0.147	60	8038	44.6	-85
	190	1000	9500	10500	500	131.62	0.69	-0.234	60	7897	41.6	-141
	200	1000	10000	11000	500	128.56	0.64	-0.360	60	7714	38.6	-183
	210	1000	10500	11500	500	124.76	0.59	-0.380	60	7486	35.6	-228
	220	1000	11000	12000	500	120.19	0.54	-0.457	60	7211	32.8	-275
	230	1000	11500	12500	500	114.86	0.50	-0.533	60	6892	29.9	-319
	240	1000	12000	13000	500	108.77	0.45	-0.609	60	6526	27.2	-366
	250	1000	12500	13500	500	101.92	0.41	-0.685	60	6115	24.5	-411

*Optimum input level

Olukosi, J. O. (1972). Production functions and economic optima for corn and grain sorghum under fertilization and irrigated experimental

plot in West-Central Kansas. M.Sc. Thesis, Department of Agricultural Economics, Kansas State University, Manhattan, Kansas, U.S.A.

In the first five rows of the table MVP is greater than MC. At the sixth financial input level MVP and MC are about equal. At this point the additional income and the additional financial input are equal in their values. Beyond the sixth unit of financial input MVP is less than MC, implying that profit reduces as more financial inputs are applied. The profit maximisation financial input level is, therefore, at the point where $MVP = MC$.

The following decision rules therefore can be deduced from the foregoing analysis:

1. When $MVP > MC$, the marginal output enhances profit; conversely, if $MVP < MC$, the marginal output decreases the profit. At the output level where $MVP = MV$, profit is at its highest level. This principle has the following implications for the financial manager:
2. When $MVP > MC$, he should increase the present level of financial input use. But when $MVP < MC$, he should reduce the level of financial input use.

If column 7, MC figures are plotted, it is a horizontal line at the level of unit price of the variable input (N fertilizer). When the marginal value product figures in column 13 are plotted, it is declining and downward sloping as shown in Figures 1.2 and 1.3. Therefore, there must be a point when the two curves will intersect each other at profit maximisation point.

Following the Decision Rule, the foregoing analysis also shows that:

- (1) When $MVP > MC$ it pays to add more financial input to increase price
- (2) When $MVP < MC$ it pays to reduce the level of financial input up to the point
- (3) When $MVP = MC$ and profit is maximised.

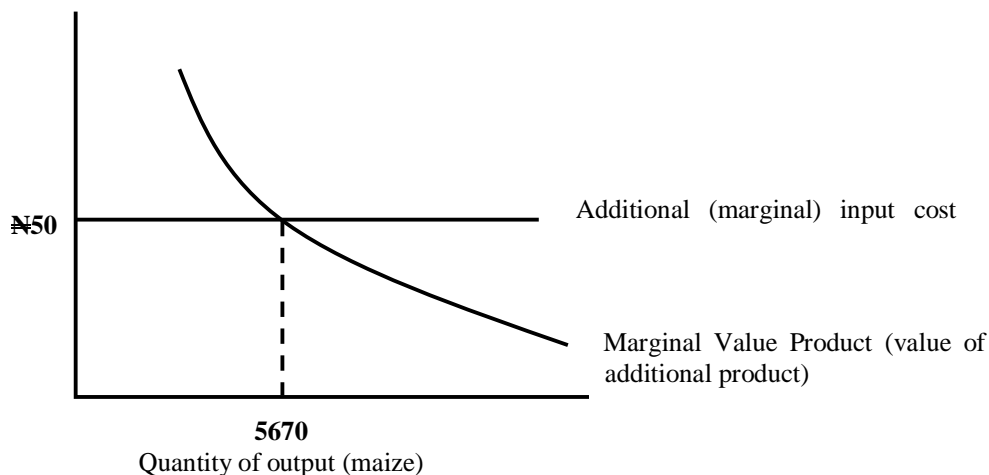


Fig. 1.3: Optimum Level Determination

Self-Assessment Exercises

1. Critically examine the law of diminishing returns.
2. State the principle of marginalisation.

1.5 Principle of Marginalisation

This principle is postulated to describe the behavioural rule in the decision-making process of the farm. Under perfect competition, short-run profits are maximised at the intersection of MC and MR curves. This applies to the profit maximisation process in the short-run period, but, with the assumption that the temporal decisions are independent. This principle also implies profit maximisation of the farms in the long run.

Mathematical Derivation of the Principle of Marginalisation

Assume that the objective of the farm is to maximise profits in the short-run period under perfect competition; then its profit π is defined by the equation (3.1).

$$\pi_t = R_t - C_t \quad \dots\dots (3.1)$$

Where, π_t = profit in naira of the farm in the t^{th} period (short run period)

R_t = Total revenue in naira in t^{th} period

C_t = Total cost in naira in t^{th} period

We know that R_t is a function of output, i.e. $(X) R_t = f_1(X)$ and similarly, cost is a function of output, i.e.

$C_t = f_2(X)$, and given the price P .

Profit equation in terms of revenue and cost functions is expressed in equation (3.2)

$$\pi = f_1(X) - f_2(X) \quad \dots\dots (3.2)$$

Applying the first order of the profit maximization to the above equation (3.2) i.e., the first derivative (for its meaning and application please refer to Appendix A) with respect to X is equal to zero. Differentiating the total profit function and equating it to zero, we get the equations:

$$\frac{\partial \pi}{\partial X} = \frac{\partial R}{\partial X} - \frac{\partial C}{\partial X} = 0 \quad \dots\dots (3.3)$$

$$= \frac{\partial \pi}{\partial X} = \frac{\partial R}{\partial X} \quad \dots\dots (3.4)$$

The term $\frac{\partial R}{\partial X}$ in equation (3.4) is the slope of the revenue curve, i.e., marginal revenue (MR). Similarly, $\frac{\partial C}{\partial X}$ is the slope of the total cost curve,

i.e., the marginal cost (MC). Thus, the first order condition for profit maximization gives:

$$MR = MC \quad \dots\dots (3.5)$$

Since MR is equivalent to P, i.e., price per unit of output, the first order condition may be written as:

$$P = MC \quad \dots\dots (3.6)$$

The second order condition of maximum profit requires that the second derivative of the total profit function is less than zero and expressed as:

$$\frac{\partial^2 \pi}{\partial X^2} = \frac{\partial^2 R}{\partial X^2} - \frac{\partial^2 C}{\partial X^2} = 0 \quad \dots\dots (3.7)$$

$$= \frac{\partial^2 R}{\partial X^2} - \frac{\partial^2 C}{\partial X^2} < 0 \quad \dots\dots\dots (3.8)$$

$$= \frac{\partial^2 R}{\partial X^2} < \frac{\partial^2 C}{\partial X^2} \quad \dots\dots\dots (3.9)$$

In equation (3.9), $\frac{\partial^2 R}{\partial X^2}$ is the slope of the MR curve, whereas the term $\frac{\partial^2 C}{\partial X^2}$ is the slope of the MC curve. This means that the slope of MR is less than slope of the MC curve. This confirms the theory that the MC curve must have a positive slope and rising and it must intersect MR curve from below, but in pure competition (*it refers to the market structure with the assumptions as presence of large number of sellers and buyers, product homogeneity, free entry and exit of firms, profit maximisation and absence of government intervention in the market through tariff and rationing of products*) the MR curve is a straight line implying that the slope of the MR curve is zero. Hence, the second order condition for profit maximisation is simplified and expressed as:

$$0 < \frac{\partial^2 C}{\partial X^2} \text{ or } \frac{\partial^2 C}{\partial X^2} > 0 \quad \dots\dots\dots (3.10)$$

which means the MC curve must have a positive slope and also rising. This situation is represented in the Figure 1.4.

Decision Rules

The following decision rules are drawn from the principle of marginalisation:

- (1) If $MC < MR$, profits are not maximised; so, it is desirable for the farm to expand its production in the short-run.
- (2) If $MC > MR$, the profits will be reduced; consequently, the farm has to cut down the present level of production.
- (3) If $MC = MR$, profit is maximised and input application is at its optimal level.

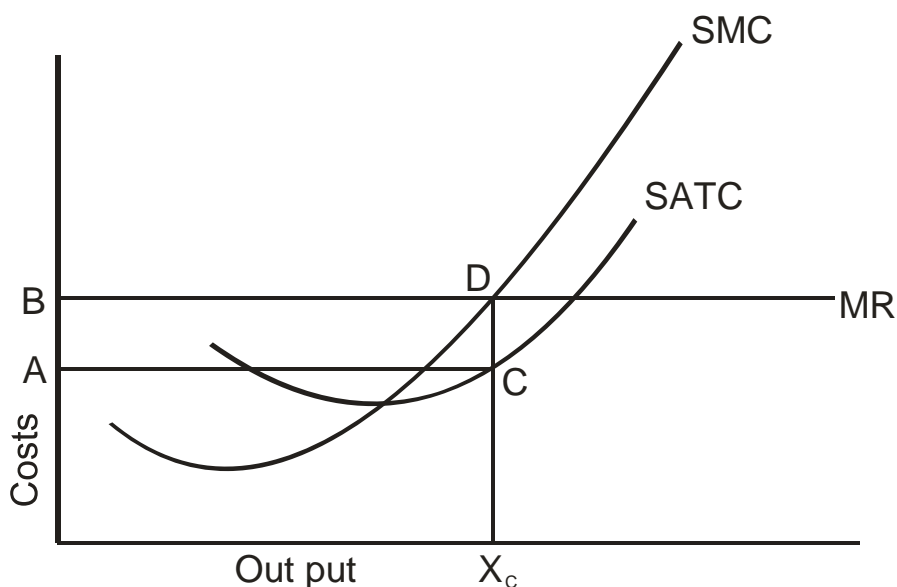


Fig. 1.4: Short Run Cost Curves

SMC = Short run marginal cost curve with positive slope and rising trend

SATC = Short run average total cost curve with 'U' shape

MR = Marginal revenue curve with 0 slope

X_c = Optimal output

BACD = Profit

1.6 Summary

You learnt about the relationship between the input and output, the law of diminishing returns, principles of marginalisation and their decision rules.

In this unit, you have learnt that:

- the law of diminishing returns provides the basis for determining whether production is profitable and, if so, the level of production which will maximise returns.
- the principle of marginalisation provides for the following decision rules that:
 - ✓ if $MC < M$, profits are not maximised; so, it is desirable for the farm to expand its production in the short run.

- ✓ if $MC > M$, the profits will be reduced; consequently, the farm has to cut down the present level of production.
- ✓ if $MC = M$, profit is maximised and input application is at its optimal level.

1.7 References/Further Readings/Web Resources

Lee, W. *et al.* (1988). *Agricultural Finance*. Kalyani, New Delhi.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Olukosi, J. O. & Ogungbile, A. O. (2008). *Introduction to Agricultural Production Economics: Principles and Applications*, Nigeria: AGITAB Publishers Ltd.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

Olukosi J. O. & Erhabor P. O. (2012). *Introduction to Farm Management Economics: Principles and Applications*. Nigeria: AGITAB Publishers Ltd.

1.8 Possible Answers to Self-Assessment Exercise(s)

1. The law forms the framework for marginal analysis which is the most powerful tool in economics. The law of diminishing returns refers to the amount of additional output obtained as additional inputs of variable factors of production are added to a set of fixed number of other factors. In its simplest form, it is expressed as follows: with one factor of production held constant or fixed, the additional output derived from each additional unit of a variable factor declines after a certain level of variable factor used has been attained.

2. The Principle of Marginalisation. This principle is postulated to describe the behavioural rule in the decision-making process of the farm. Under perfect competition, short-run profits are maximised at the intersection of MC and MR curves. This applies to the profit maximisation process in the short-run period, but, with the assumption that the temporal decisions are independent. This principle also implies profit maximisation of the farms in the long run.

Unit 2 Input-Input Relationships

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Substitution Ratio
 - 2.3.1 Decision Rule
- 2.4 Summary
- 2.5 References/Further Readings/Web Resources
- 2.6 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

The problem of input choice assumes vital importance, particularly when alternatives of producing a given product are available. Most of the agricultural products are produced with two or more critical inputs. In this context, substitution of one input for the other with least cost, to produce a given output, forms the basis for most of the decision-making problems. In livestock, grain ration is substituted for forages and in crop production, herbicides are substituted for human labour, fertilizers for farm yard manure (FYM), etc. The managerial problem here is to find out the least cost combination of inputs for producing a given output.

In this unit, the relationships between the variable inputs are discussed and their relationships with the level of output.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- differentiate between isoquant and isocost
- determine least cost combinations of factors of production to produce a certain level of output
- explain types of substitution between inputs.

2.3 Substitution Ratio

You will recall in the previous unit, that the relationship we considered was between a variable input and the output while other inputs are held constant. In this unit, we shall consider the case where there are two variable inputs instead of one. There is bound to be relationship between the two variable inputs on one hand and of course relationship between the two variable inputs and the output itself. The isoquant is a curve that connects the various combinations of the two variable inputs that can be used to produce the same level of output.

As mentioned earlier, the problem facing the financial manager here is to determine which of these numerous combinations of the variable inputs will give the least cost in producing the specified level of output represented by that particular isoquant. This question cannot be answered until we know how much each of the variable input costs. We therefore bring prices of the variable inputs into the picture.

There is a line called isocost line. The isocost line connects the various combinations of the variable inputs that can be purchased at the same cost. “Iso” means equal. “Isocost” means equal cost. Therefore, for the purpose of determining the least cost combination of inputs for producing a given level of output, the first step lies in finding out the substitution ratio of the two inputs in question. Substitution ratio is determined from the following expression:

$$\text{Substitution ratio} = \frac{\text{Quantity of input replaced}}{\text{Quantity of input added}} = \frac{\Delta X_2}{\Delta X_1}$$

This substitution ratio is also called Marginal Rate of Technical Substitution (MRTS).

If there is a constant rate of substitution between the inputs, corresponding isoquants will be a straight line (Figure 2.1).

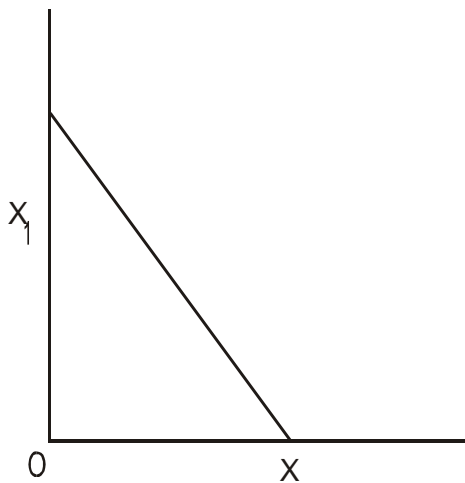


Fig. 2.1: Linear isoquant

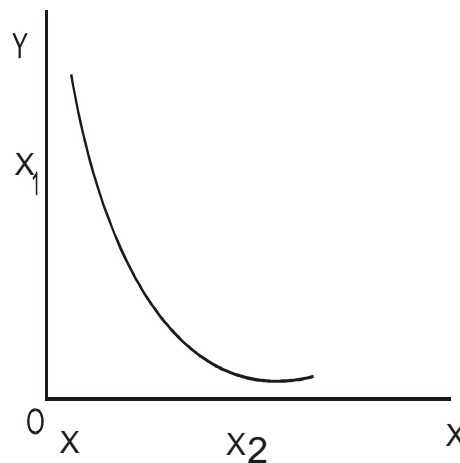


Fig. 2.2: Convex isoquant

In the case of diminishing rate of substitution, the isoquant is convex to the origin as shown in Figure 2.2. Isoquants and indifference curves exhibit similarity to a large extent. Various combinations of two inputs for producing a given amount of output depict an isoquant, while indifference curve shows various combinations of two consumable goods that yield a given amount of satisfaction. Keeping in view this similarity, isoquants are frequently addressed as production indifference

curves. The slope of the isoquant is negative and its absolute value indicates the marginal rate of technical substitution (MRTS). Isoquants are convex to the origin.

In the case of Leontief isoquant, the substitution ratio is fixed and the isoquant takes the shape of a right angle triangle as shown in Figure 2.3.

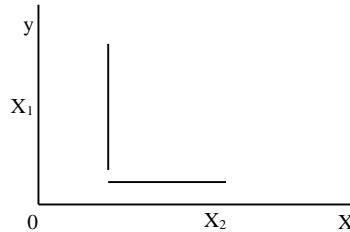


Fig. 2.3: Leontief Isoquant

To find out the optimal level of input combination, the ratio of input prices is compared with the substitution ratio. Price ratio is defined as follows:

$$Price\ ratio = \frac{Price\ of\ input\ being\ added}{Price\ of\ input\ being\ received} = \frac{PX_1}{PX_2}$$

This price ratio is also the slope of the isocost line.

The least cost combination of inputs will be at a point where the substitution ratio (MTRS) and inverse price ratio are equal. The least cost principle is shown with the help of livestock data in Table 3 and its diagrammatic representation in Fig. 8. This principle helps the financial manager in allocating the limited finance in purchasing two important substitutable inputs.

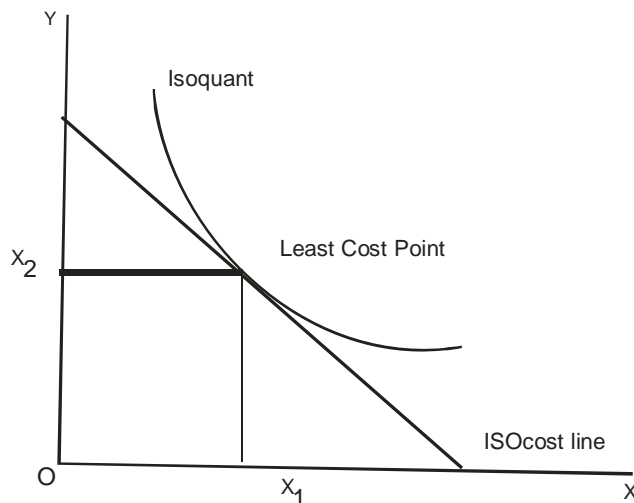


Fig. 2.4: Least Cost Combination of Two Inputs

Costs are at minimum point, where input substitution ratio (MTRS) is equal to inverse of the price ratio. This is the point of tangency between the isocost line and the isoquant. From the Table below, it is found at the feed combination “F”. Substitution ratio will remain the same over time, provided physical/biological relationships do not change. The price ratio changes if relative input prices change. In the hypothetical example, it is assumed that prices will not change. As the price of one input increases compared to another, the existing least cost combination tends to change.

Self-Assessment Exercises

1. State the importance of the least cost principle.
2. What is ‘isocost line’?

2.3.1 Decision Rule

If the Substitution Ratio is greater than Price Ratio, the total cost of feed ration can be reduced by moving downwards to the succeeding ration in the Table. If the Substitution Ratio is less than Price Ratio, the converse holds good.

Table 2.1: Selecting Least Cost Feed Ration for Producing 25kg Body weight

Feed combination	Grain (kg)		Hay (kg)		MRTS	Price Ratio
	(X ₁)	ΔX ₁	(X ₂)	ΔX ₂	X ₁ for X ₂	P _{X₂} /P _{X₁}
A	500		2190			
B	550	50	2065	125	2.5	2.10
C	600	50	1943	122	2.44	2.10
D	650	50	1825	118	2.36	2.10
E	700	50	1715	110	2.20	2.10
F	750	50	1610	105	2.10	2.10*
G	800	50	1512	98	1.96	2.10
H	850	50	1425	87	1.74	2.10
I	900	50	1349	76	1.52	2.10
J	950	50	1289	60	1.20	2.10
K	1000	50	1233	56	1.12	2.10

*Optimum combination

2.4 Summary

In this unit, you have learnt that:

- isoquants connect various combinations of inputs that can be used to produce the same level of output.
- an isocost connects the various combinations of two variable inputs that can be purchased at the same cost.
- when the isocost line is tangent to the isoquant, the point of least cost combination of the variable inputs is determined.
- the point of tangency corresponds to where the Marginal Rate of Technical substitution is equal to the ratio of prices of the two variable inputs i.e.

$$\frac{\text{Quantity of input replaced}}{\text{Quantity of input added}} = \frac{\Delta X_2}{\Delta X_1}$$

$$\frac{\text{Price of input being added}}{\text{Price of input being received}} = \frac{PX_1}{PX_2}$$

You have also learnt about the relationship between two variable inputs for producing a certain level of output. The relationship is in the way they substitute for each other.

2.5 References/Further Readings/Web Resources

Olukosi, J. O. & Ogungbile, A. O. (2008). *Introduction to Agricultural Production Economics: Principles and Applications*, Nigeria: AGITAB Publishers Ltd.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Olukosi J. O. & Erhabor P. O. (2012). *Introduction to Farm Management Economics: Principles and Applications*. Nigeria: AGITAB Publishers Ltd.

2.6 Possible Answers to Self-Assessment Exercise(s)

1. The least cost combination of inputs will be at a point where the substitution ratio (MTRS) and inverse price ratio are equal. This principle helps the financial manager in allocating the limited finance in purchasing two important substitutable inputs.
2. **Isocost Line:** The isocost line connects the various combinations of the variable inputs that can be purchased at the same cost. “Iso” means equal. “Isocost” means equal cost. Therefore, for the purpose of determining the least cost combination of inputs for producing a given level of output the first step lies in finding out the substitution ratio of the two inputs in question.

Unit 3 Product-Product Relationships

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Production Possibility Curve
- 3.4 Competitive Enterprises
- 3.5 Optimal Enterprise Combination
 - 3.5.1 Decision Rule
- 3.6 Types of Product-Product Relationships
- 3.7 Mathematical Derivation of Optimal Enterprise Combination
- 3.8 Summary
- 3.9 References/Further Readings/Web Resources
- 3.10 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

You have thus far learnt about the relationship between the variable input and the output. You have also learnt about the relationship between two variable inputs used to produce a single output. This unit is about the relationship between two products that are produced using the same inputs.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain possibility curve and the iso-revenue line
- determine maximum revenue output combination
- state the different types of product-product relationships.

3.3 Production Possibility Curve

Given a set of resources that can be used to produce two enterprises, it is possible to have many different combinations of the two enterprises that can be produced by the same amount of inputs. The line joining these various combinations is called the Production Possibility Curve. The question is, among the various combinations of these enterprises, which combination will yield the highest net revenue?

Here, the problem lies in finding out the combination of enterprises that give greatest net income. When resources are limited, this principle assumes greater importance in selecting combination of enterprises. The problem in this principle primarily depends upon the inter-relationship

between enterprises, i.e., whether they are independent, joint, complementary, supplementary or antagonistic.

3.4 Competitive Enterprises

When resources are limited, enterprises compete for their use. The two relevant questions in this context are which enterprise should be included in the farm business and how large should it be? The rate of substitution of one enterprise receives larger reduction in the other enterprise. Increasing rate of substitution is most common in agriculture because of diminishing marginal productivity of enterprises. Constant rate of substitution is possible when constant amount of one enterprise is replaced by the other enterprise. An example of enterprise combination is provided in Table 3.1.

3.5 Optimal Enterprise Combination

Profit maximising enterprise combination lies in knowing the trade-off between the enterprises and price ratio. This trade-off line is called production possibility curve (PPC). The Production Possibility Curve represents all possible combinations of two products that could be produced with a given quantity of inputs. Since this curve (PPC) assumes a fixed level of finance or any other crucial input, it is also called iso-resources curve.

To know which of the enterprise combination will give the highest net revenue, we have to introduce prices of the two products. The line connecting the various combinations of the two outputs that will yield the same revenue is called iso-revenue line. The slope of this iso-revenue line is the ratio of the prices of the two enterprises.

Table 3.1: Combination of Output of Crops Y₁ and Y₂ with ₦10,000 of Financial Input (P_{y1} = ₦4.2, P_{y2} = ₦6.00)

Product Combination		Output of crop		MRTS of	Price
Output of crop		Output of crop		Y ₂ for Y ₁	ratio
(kgs.)		(kgs.)		(ΔY ₂ /ΔY ₁)	(P _{Y1} /P _{Y2})
Y ₁	ΔY ₁	Y ₂	ΔY ₂		
0		60			
	20		4	0.2	0.70
20		56			
	20		6	0.3	0.70
40		50			
	20		9	0.45	0.70
60		41			
	20		11	0.55	0.70
80		30			
	20		14	0.70*	0.70*
100		16			
	20		16	0.80	0.70
120		0			

*Optimum enterprise combination.

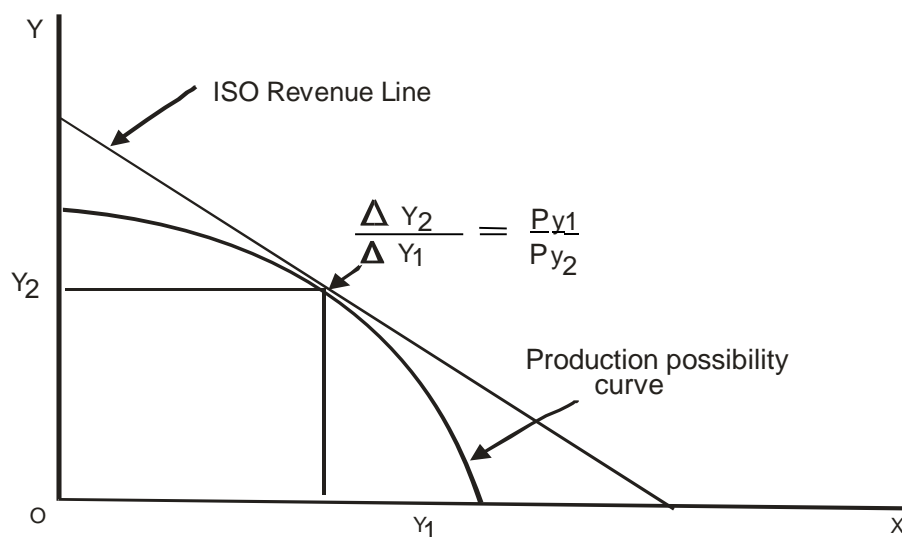


Fig. 3.1a: Optimum Combinations of Two Enterprises

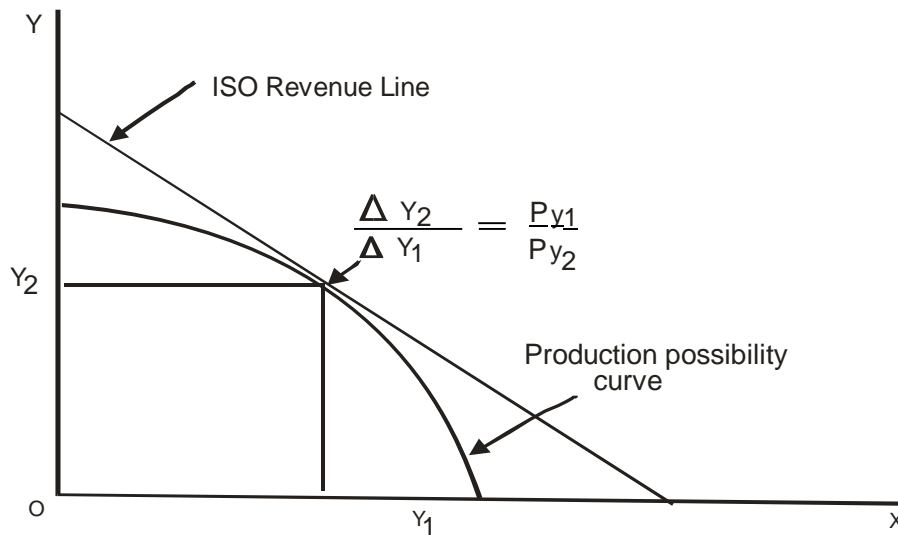


Fig. 3.1b: Optimum Combinations of Two Enterprises

The substitution ratio is called the Marginal Rate of Product Transformation (MRPT) and the price ratio will be compared for knowing the optimum enterprise combination which is defined as follows:

$$\text{Substitution ratio (MRPT)} = \frac{\text{Quantity of output lost}}{\text{Quantity of output gained}}$$

$$\text{Price ratio} = \frac{\text{Unit price of output gained}}{\text{Unit price of output lost}}$$

Profit is maximised at the point where substitution ratio (MRPT) is equal to inverse of the price ratio, i.e.,

$$\frac{\Delta Y_2}{\Delta Y_1} = \frac{P_{y_1}}{P_{y_2}}$$

In the hypothetical example, it occurs at 6th combination, the optimum combination of the two enterprises is illustrated in Figure 3.1.

3.5.1 Decision Rule

The procedure for determining profit maximisation is basically analogous to that of least cost principle, but with one exception. For enterprise combination when substitution ratio is less than the price ratio, substitution should continue by moving downwards to the right on the PPC. Conversely, when substitution ratio is greater than price ratio, MC i.e. value in bold in columns 6 and column 13. The exact quantity of nitrogen would mean too much substitution taking place and adjustment should be upward, i.e., to the left of PPC.

The profit maximisation point is where the iso-revenue line is tangent to the PPC i.e. the slopes of the PPC curve is equal to the slope of the iso revenue line as shown in Figure 3.1.

3.6 Types of Product-Product Relationships

When enterprises have constant rate of substitution, the PPC assumes a straight line touching the two axes (Figure 3.2).

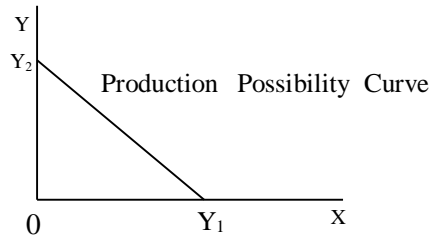


Fig. 3.2: Enterprises Substituting at Constant Rate

Here the profit maximisation solution will be to produce one of the enterprises but not a combination of enterprises. An increasing substitution ratio will result in combination of enterprises. The combination depends upon the current price ratio. Any change in the price ratio of the output will affect profit maximising enterprise combination.

The shape of the PPC curve will differ when other types of enterprise combinations are considered. These could be complementary relationship or supplementary relationship, which are shown in the Figures 3.3 and 3.4 respectively.

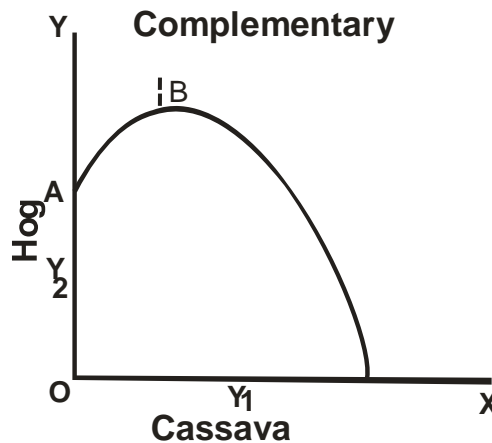


Fig. 3.3: Complementary Relationship

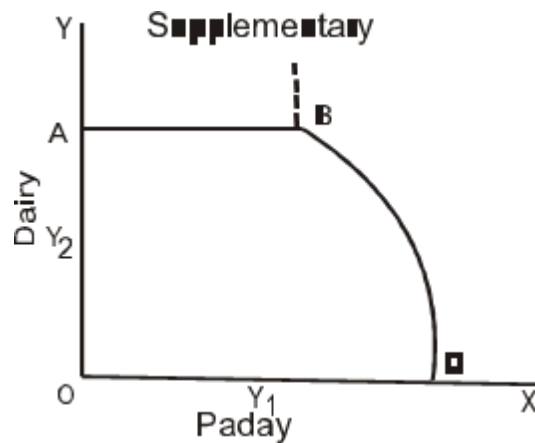


Fig. 3.4: Supplementary Relationship

Two enterprises are said to be complementary if the increase in production of one enterprise leads to increase in the production of the other enterprise (Figure 3.3). In the diagram on PPC, up to the point “B” cassava is complementary to Hog and beyond point “B” it becomes competitive. The enterprises are said to be supplementary if the production of one enterprise can be increased without affecting production of the other enterprise. In Figure 3.4 up to the point “B” paddy rice, enterprise is supplementary to dairy enterprise. Beyond point “B” the two enterprises become competitive.

Enterprises are not usually complementary for all combinations and hence they become competitive after certain degree of combinations.

Self-Assessment Exercises

1. What do you understand by supplementary enterprises?
2. When do we say that two products are complementary?

3.7 Mathematical Derivation of Optimal Enterprise Combination

Resources can be allocated to produce two or more products. Let us assume a single variable input (capital in units of thousands of naira) is used to produce two products Q_1 and Q_2 . Production possibility can be produced with a fixed level of capital input, i.e., 20 units. To draw the production possibility curve, we assume two production functions Q_1 and Q_2 as dependent variables and X_1 variable the independent variable i.e., capital input.

Therefore, $Q_1 = f(X_1)$ (3.11)

$Q_2 = f(X_1)$ (3.12)

Further we assume that the available capital with the farmer is $X'_1 = (20)$. This is given by the equation as:

$X^o_1 \geq X_1Q_1 + X_1Q_2$ (3.13)

According to equation (3.13) the sum of the capital input should not exceed X'_1 .

The Marginal Rate of Product Transformation (MRPT) is the marginal rate of substitution of one product for the other, i.e. Q_1 for Q_2 or Q_2 for Q_1 . This is measured from the ratio of the first derivatives of equations (3.11) and (3.12).

Algebraically MRPT is defined as:

$MRPT = MP_1Q_1/MP_1Q_2$

Let us assume the estimated production functions (3.11) and (3.12) as:

$\hat{Q}_1 = 15X_1^{0.4}$ (3.14)

$\hat{Q}_2 = 20X_1^{0.5}$ (3.15)

Then $RPT = \frac{15 \times 0.4X_1^{-0.6}}{20 \times 0.5X_1^{-0.5}}$

Let $P_{Q_2} = \text{N}415$ and $P_{Q_1} = \text{N}250$

Inverse price ratio of products = $\frac{415}{250} = 1.66$

Assume $Q_1 = 20$, the X_1 is obtained by substituting $Q_1 = 20$ in equation (3.14)

$X^{\wedge} = 2.04$

The remaining of X_1 capital invested in production of

$Q_2 = 20.00 - 2.04 = 17.96$

Using X_1 levels in the production of Q_1 and Q_2 in equations (3.14) and

(3.15) we can derive $MRPT = \frac{dQ_1}{dX_1} \div \frac{dQ_2}{dX_1}$

= $\frac{15 \times 0.4 (2.04)^{-0.60}}{20 \times 0.5 (17.96)^{-0.5}}$

= $\frac{6 \times (0.6519)}{10 \times (0.236)}$

= $\frac{3.917}{2.36}$

= 1.6573

= 1.66

Since MRPT is equal to the inverse price ratio of the products, the optimal levels of products Q_1 and Q_2 are 20 kg and 84.76 kg respectively. Q_2 level is obtained by substituting X_1 level, i.e. 17.96 in equation (3.15).

3.8 Summary

In this unit, you have learnt that:

- a production possibility curve connects various combinations of two outputs that can be produced using the same inputs.
- an iso-revenue line connects the various combinations of two outputs that yield the same revenue. It is the ratio of the prices of the two outputs.
- when the iso-revenue line is tangent to the production possibility curve, the point of optimum combination of the enterprises is determined.
- the point of tangency corresponds to where the Marginal Rate of Product Transformation is equal to the ratio of prices of the two outputs i.e.

$$\frac{\text{Quantity of output lost}}{\text{Quantity of output gained}} = \frac{\text{Unit price of output gained}}{\text{Unit price of output lost}} =$$

$$\text{i.e. } \frac{\Delta Y_2}{\Delta Y_1} = \frac{P_{Y_1}}{P_{Y_2}}$$

You have also learnt about the relationship between two products that are produced using the inputs. The relationship is in the way they compete for use of input or complement or supplement each other.

3.9 References/Further Readings/Web Resources

- Olukosi, J. O. & Ogungbile, A. O. (2008). *Introduction to Agricultural Production Economics: Principles and Applications*. Nigeria: AGITAB Publishers.
- Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*, Nigeria: Great Glory Publishers.
- Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

3.10 Possible Answers to Self-Assessment Exercise(s)

1. Two enterprises are said to be supplementary if the production of one enterprise can be increased without affecting production of the other enterprise. The production of cassava and yam in the same farm is an example. Enterprises are not usually complementary for all combinations and hence they become competitive after certain degree of combinations.
2. **Complementary Products:** Two enterprises are said to be complementary if the increase in production of one enterprise leads to increase in the production of the other enterprise (Figure 3.3). In the diagram on PPC, up to the point “B” cassava is complementary to Hog and beyond point “B” it becomes competitive.

Unit 4 Principle of Equi-marginal Returns and Opportunity Cost

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Average and Marginal Returns to Capital
- 4.4 Maximising Profit on Farms with Adequate Capital
- 4.5 Maximising Profit on Farms with Limited Capital
- 4.6 Decision Rule for Equi-marginal Returns Principle
- 4.7 Opportunity Cost Principle
- 4.8 Summary
- 4.9 References/Further Readings/Web Resources
- 4.10 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

When financial input is a constraint, the farm manager must prudently decide as to how available finance should be allocated or used among many possible alternatives. Decisions are to be made on the best allocation of limited financial input among many hectares of crops, different types of livestock, etc. The equi-marginal principle provides guidelines and ensures that allocation is done in such a way that profit is maximised.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain average and marginal returns to capital
- describe equi-marginal returns principle
- analyse the uses of equi-marginal returns principle.

4.3 Average and Marginal Returns to Capital

Farm financial management requires that manager should be able to distinguish between average and marginal returns to capital. Average returns relate to the return on all the capital invested in an enterprise while marginal returns to the return on an extra (added or marginal) sum of capital. The difference between the two is illustrated in Table 4.1 which shows data for a farmer that has three farms each with its different enterprises or enterprise combination. Judging from the average returns only, one would think that Farm 3 yields a greater return that is, 20% on ₦10,000 and 17.5% on ₦12,000. Farm 1 yields a higher marginal return of 30% than either Farm 2 or 3.

The farmer could be tempted to invest the extra ₦2,000 on Farm 3 based on the average returns but considering the marginal returns, it should be invested on Farm 1. Therefore, average figures taken in isolation can obviously be misleading.

4.4 Maximising Profit on Farms with Adequate Capital

Once capital is adequate for the farmer to operate with, he is at liberty to employ inputs up to the level where marginal revenue is equal to the marginal cost. The quantity of input at point of profit maximisation is as shown in figure 4.1 and the quantity of output as profit maximisation point is shown in figure 4.2. In these two figures, capital, which is not limiting is one of the fixed inputs.

Table 4.1: Average and Marginal Returns on Capital in Different Enterprises

	FARM 1	FARM 2	FARM 3
Capital invested	10,000	10,000	10,000
Return on 10,000	1,000	500	2,000
Average return	10%	5%	20%
Incr. in capital invested	2,000	2,000	2,000
Return on extra 2,000	600	200	100
Marginal return on extra 2000	30%	10%	5%
Total return on 12,000	1,600	700	2,100
Average return on 12,000	13.3%	5.8%	17.5%

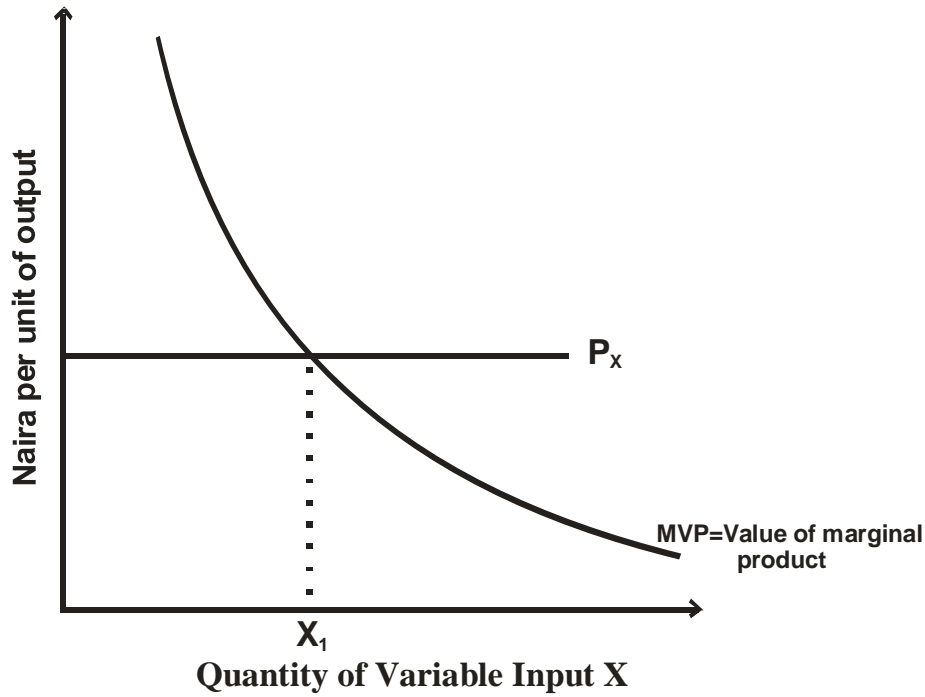


Fig. 4.1: Determination of quantity of input where marginal revenue equals marginal cost when capital is adequate

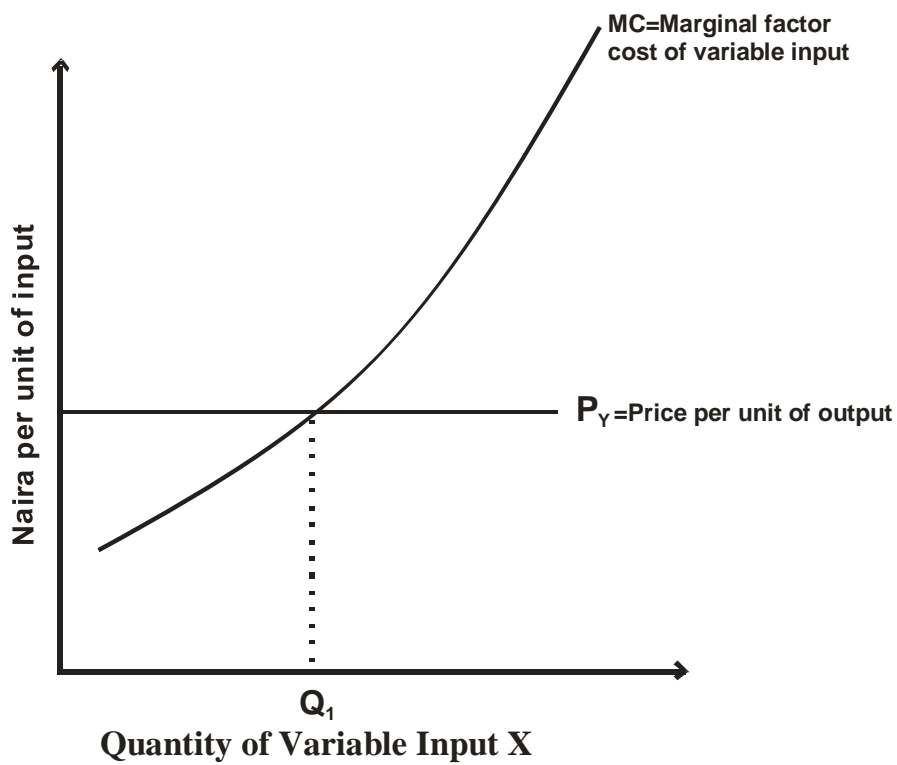


Fig. 4.2: Determination of quantity of output where marginal revenue equals marginal cost when capital is adequate

4.5 Maximising Profit on Farms with Limited Capital

If the capital is limited, then the concept of equi-marginal returns becomes important. To maximise profit, the farmer with limited input of finance should allocate the available finance (capital input) among the enterprises in accordance with the principle of equi-marginal returns.

The principle is stated as follows. A limited input (finance) should be allocated among alternative uses in such a way that the marginal value product of the last unit of input is equal in all uses. In Table 6 the application of equi-marginal principle, on the use of limited financial input unit is provided as an example.

4.6 Decision Rule for Equi-marginal Returns Principle

The limited available financial input must be allocated among the three crops in the following manner using the Marginal Value Products (MVPs). First three units should be allocated to sugarcane and one unit each to cotton and paddy rice respectively which gives the maximum income of (₦11,900) as shown in Table 4.2. Diagrammatic representation of the principle is shown in Figure 4.3.

The principle of equi-marginal returns can be stated in another way thus: **At least ₦1 spent on an enterprise or factor of production will yield a marginal return exactly equal to the last ₦1 spent on all other enterprises or factors of production.** This means that if ₦1 is spent on buying fertilizer, then the additional feed should be purchased up to that point where the last ₦1 spent on feed will return the same as the last ₦1 spent on the fertilizer.

Table 4.2: Principle of Equi-Marginal Returns

Financial input in '000 (₦)	Marginal value products per unit of '000 ₦		
	Paddy rice	Sugarcane	Cotton
1	1,800*	3,000*	2,000*
2	1,200	2,800*	1,600
3	1,000	2,300*	1,200
4	900	1,400	800
5	800	1,000	600

*Total income = (3,000 + 2,800 + 2,300 + 2,000 + 1,800) = ₦11,900

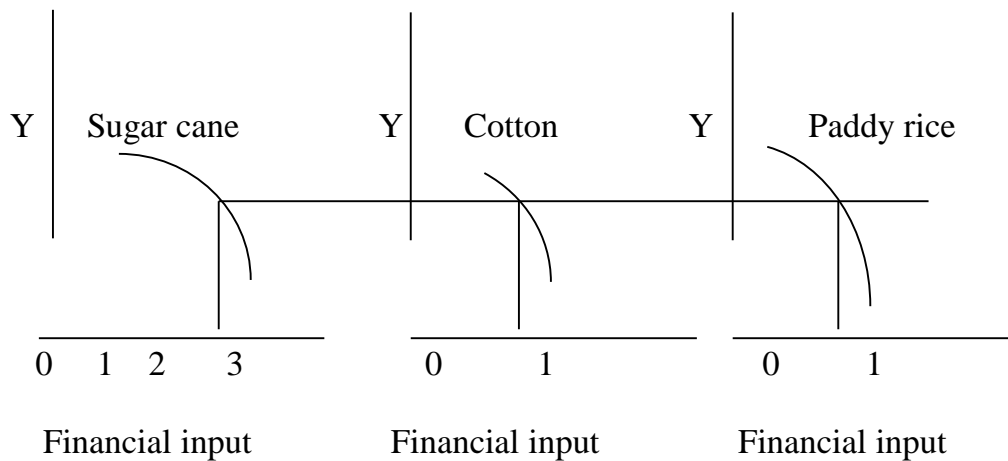


Fig. 4.3: Principle of Equi-marginal Return

4.7 Opportunity Cost Principle

Another principle of importance related to that of Equi-marginal Returns is Opportunity Cost Principle. The farm financial manager has got many choices regarding the use of inputs. If an input is used in a particular production process, it has no alternative use at that point of time. This means that the input will be losing the income from its alternative use and this income forgone by this input from its alternative use is called opportunity cost. Opportunity cost is the income that could have been received if the input had been used in its most profitable alternative use. Alternatively, it is the value of product not produced because the input was used for another purpose. The concept of opportunity cost will have a bearing on the decision-making process of farm manager, particularly in decisions related to input use.

The opportunity cost in economics is referred to as the real cost of an input. Real cost of an input is not the purchase price of the input. It is the income earned by the input in its alternative use, which is the next best opportunity.

Apart from the input use decisions, opportunity cost principle is a useful device in selecting the most profitable combination. In this decision-making process of selecting the enterprises, the farm financial manager has to consider all the enterprises suited to his farm situation and resource endowment. The income from all the next best alternative enterprises is given importance, following the principle of opportunity cost and the most profitable enterprise is selected by the farm financial manager. This selection process is similar to the procedure followed by the principle of equi-marginal returns. Inputs use decisions and decisions of most profitable enterprise selections are indeed based on opportunity cost principle or the principle of equi-marginal returns.

However, working out the opportunity cost of capital assets entails problems. One such problem is regarding the determination of value of service provided by the land, machinery, farm buildings, livestock, etc., in their alternative uses. Before arriving at the values of the services, determination of fixed costs involves many problems. Once the problems associated with the value determination of the assets in the next best alternative use are solved, this principle then can be conveniently used. To simplify the complexities involved in value determination, sometimes crude approximations to these values were resorted to by the economists and researchers in the past, when there was a constraint of time and data limitation. These approximations include giving 2 to 3 percent depreciation to farm structures and interest rate on capital equal to return on savings or cost of borrowed capital. So, this principle is not that simple as it appears for application to all types of farm financial decisions.

Self-Assessment Exercises

1. State the opportunity cost principle.
2. State the equi-marginal principle.

You learnt that when capital is adequate the farmer can use inputs to the point where marginal revenue equals marginal cost. When capital is limited the farmer should use the principle of equi-marginal returns. You have learnt that opportunity cost is the income that could have been received if an input is used in its most profitable alternative use.

4.8 Summary

In this unit you have learnt that:

- Average returns relate to the return on **all the capital invested** in an enterprise while marginal returns relate to the return on **an extra** (added or marginal) **sum of capital**.
- Taking average figures in isolation can mislead the farmer in allocating extra capital available in an enterprise that will yield less extra returns.
- When capital is adequate the farmer should employ inputs to the point where the marginal revenue is equal to the marginal cost.
- When capital is limiting the farmer should employ the concept of equi-marginal returns. He should ensure that the marginal value product of the last unit of input is equal in all uses.
- Opportunity cost is the income that could have been received if an input is used in its most profitable alternative use.

4.9 References/Further Readings/Web Resources

Olukosi, J. O. & Ogungbile, A. O. (2008). *Introduction to Agricultural Production Economics: Principles and Applications*, Nigeria: AGITAB Publishers Ltd.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*, Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

4.10 Possible Answers to Self-Assessment Exercise(s)

1. Opportunity cost is the income that could have been received if the input had been used in its most profitable alternative. Alternatively, it is the value of product not produced because the input was used for another purpose. The concept of opportunity cost will have a bearing on the decision-making process of farm manager, particularly in decisions related to input use.
2. **The equi-marginal principle is stated as follows:** A limited input (finance) should be allocated among alternative uses in such a way that the marginal value product of the last unit of input is equal in all uses.

Unit 5 Law of Comparative Advantage

Unit Structure

- 5.1 Introduction
- 5.2 Intended Learning Outcomes
- 5.3 Meaning of Comparative Advantage
- 5.4 Importance of Comparative Advantage
 - 5.4.1 The Decision Rule
- 5.5 Summary
- 5.6 References/Further Readings/Web Resources
- 5.7 Possible Answers to Self-Assessment Exercise(s)

5.1 Introduction

Factors of production are not evenly distributed throughout the world. For example, a country may have abundance of fertile land, while another is blessed with skilled manpower. Various resources of capital, mineral deposits, skilled and unskilled labour, tropical and temperate climate are factors possessed by different countries at different levels. This phenomenon leads countries to specialise in the production of those goods and services for which they have the greatest comparative advantage.

5.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define the law of comparative advantage
- discuss the importance of comparative advantage
- describe how decision rule is used for the concept of comparative advantage
- explain the limitation of comparative advantage.

5.3 Meaning of Comparative Advantage

The law of comparative advantage states that individual or regions will tend to specialise in the production of those commodities for which their resources give them a relative or comparative advantage. This principle affirms that areas of certain category will tend to specialise in the production of those commodities for which a comparative advantage exists. The differences in the relative yields, costs and benefits are to be considered as the criteria for explaining this principle.

5.4 Importance of Comparative Advantage

It is true that some crop enterprises can be raised over diversified soil types and climatic conditions, but with different yields and production costs. This difference in the yield levels and production costs leads to specialisation.

It is known that cocoa and oil palm farming are concentrated in the south region of Nigeria, groundnut in the north and tea production is confined to Mambilla, Plateau. Thus, regional specialisation in the production of crops and livestock is better explained by the principle of comparative advantage.

Therefore, the importance of this law is as follows:

- a) It makes regions specialise in those enterprises in which they have relative advantage.
- b) Specialisation leads to increase in output and reduces unit cost of production.
- c) It potentially increases the standard of living of all countries.
- d) It widens the scope of international market.
- e) It widens the scope of product consumption.
- f) It increases competition.
- g) It promotes international relations.

Self-Assessment Exercises

1. State the law of comparative advantage.
2. Explain what is meant by absolute advantage.

5.4.1 The Decision Rule

a. Absolute Advantage/Disadvantage

Consider two competing crops namely maize and groundnut in two regions, namely region I and region II. Region I have an absolute advantage in the production of both crops as shown in Table 5.1. However, the principle of comparative advantage implies that each region will specialise in the production of the crops for which its resources give higher yields only.

Table 5.1: Yields per Hectare in Tons

Crops	Region I	Region II
Maize	5.8	3.8
Groundnut	2.5	2.0

Considering only principal yields, Region I must give up 2.32 tons of maize for every ton of groundnut (i.e. ratio 1:2.32), while Region II has to sacrifice 1.90 tons of maize to get one ton of groundnut (i.e. ratio 1:1.90). Region II has an absolute disadvantage in the production of both crops, but in the case of groundnut it has a comparative advantage because it sacrifices less maize for a ton of groundnut. Thus, the concept of opportunity cost principle is taken to explain the principle of comparative advantage. Therefore, while Region I will specialise in production of maize, Region II will specialise in production of groundnut.

b. Comparative/Relative Advantage

To explain the principle, we have to hypothesise area under these crops and prices of these products. Let us assume that Regions I and II have 200 ha of land each, for these crops to grow. If the entire 200 ha in Region II is allocated to the production of groundnut, and the entire 200 ha is devoted to production of maize in Region I, then the gross income from these crops would be ₦58 million and ₦60 million respectively (Table 5.2).

Table 5.2: Assumption of Allotment of Entire Area under Maize and Groundnut in the Respective Regions

Particulars	Region I (Maize)	Region II (Groundnut)
Production	1160 tons	400 tons
Price/ton	50,000	150,000
Gross returns	58,000,000	60,000,000

To know the **comparative** advantage of regions in production of crops, we must use the following decision criterion. Under the assumption of 50 percent area under these crops in each region, the total production of maize is 960 tons and from groundnut 450 tons (Table 5.4).

Table 5.3: Assumption of Equal Area under Maize and Groundnut in Respective Regions

Particulars	Region I		Region II	
	Maize	Groundnut	Maize	Groundnut
Production (tons)	580	250	380	200
Price/ton	50,000	150,000	50,000	150,000

Gross income 29m 37.5m 19m 30m

Gain in maize production is 200 tons (i.e. 1160-960) and loss in groundnut production due to specialisation is 50 tons (i.e. 450-400). So, the decision criterion is, if income from additional maize production is more than the income lost from groundnut production, it is advantageous to have Region I in maize production and Region II in groundnut production. Total gain in income from maize is $\text{₦}50,000 \times 200 \text{ tons} = \text{₦}10 \text{ million}$. Total loss in income from groundnut is $\text{₦}150,000 \times 50 \text{ tons} = \text{₦}7.5 \text{ million}$. Therefore, since the gain in maize income is greater than the loss in income from groundnut, it is better for Region I to specialise in Maize and Region II in groundnut production. Refer also to Table 5.4 for more detailed information.

Table 5.4: Assumption of Equal Area under Maize and Groundnut in Regions

Region I			Region II		
Crop	Farm size (ha)	Yield (tons)	Crop	Farm size (ha)	Yield (tons)
Maize	200	1,160	Groundnut	200	400
Maize	100	580	Groundnut	100	200
Groundnut	100	250	Maize	100	380
Difference		960	Difference	(250+200)	450
in maize	(580+380)	+200	in	(400-450)	-50
yield	(1160-	₦10m	Groundnut		₦7.5m
Income gain	960)		yield		
from maize			Income loss		
			from		
			groundnut		

c. Limitations of the Law of Comparative Advantage

In the above example, only yield levels and prices excluding other inputs and costs, are considered. If other inputs and their costs are also taken into account the decision criterion becomes complicated, because each input availability coupled with its costs complicates the decision criterion and hence the principle will have limitations in the choice of specialisation process. The manager has to seek the help of programming models in this regard. You will learn about more advanced models in modules that shall be treated later.

5.5 Summary

In this unit, you have been exposed to the law of comparative advantage; its meaning, importance, the decision rule and limitations.

You have learnt that comparative advantage enables regions to concentrate on producing enterprises for which they have relative advantage.

The importance of being able to specialise in certain advantageous crops makes for increased efficiency in production, increased output, widens the scope of consumption, international trade and standard of living. When considering more complex analysis for choice of specialisation, it is limited and other programming models will have to be used.

5.6 References/Further Readings/Web Resources

- Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*, Nigeria: Great Glory Publishers.
- Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

5.7 Possible Answers to Self-Assessment Exercise(s)

1. The law of comparative advantage states that individual or regions will tend to specialise in the production of those commodities for which their resources give them a relative or comparative advantage. This principle affirms that areas of certain category will tend to specialise in the production of those commodities for which a comparative advantage exists.
2. **Absolute Advantage:**
Consider two competing crops namely maize and groundnut in two regions, namely region I and region II. Region I have an absolute advantage in the production of both crops. However, the principle of comparative advantage implies that each region will specialize in the production of the crops for which its resources give it higher yields only.

Unit 6 Cost Functions

Unit Structure

- 6.1 Introduction
- 6.2 Intended Learning Outcomes
- 6.3 Short run and Long Run Costs
- 6.4 Definitions of Costs and their Shapes
- 6.5 Relationship between Total Cost, Total Variable and Total Fixed Costs
- 6.6 Relationship between Marginal, Average Variable and Average Total Costs
- 6.7 Summary
- 6.8 References/Further Readings/Web Resources
- 6.9 Possible Answers to Self-Assessment Exercise(s)

6.1 Introduction

You will recall that in module 2 unit 1, it was explained that the profit maximising situation of the farm is determined by the $MC = MR$ rule, which is known as “principle of marginalisation.” Thus, cost curves are the important components in the price-output decisions. Costs also play an important role in determining the bargaining power of the farmers and their managerial behaviour. Direction of the growth of the farm is determined by the cost considerations. This unit, therefore, defines the various cost functions and their relationships.

6.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define the various cost functions
- sketch the shapes of the cost functions
- explain relationships between the cost functions.

6.3 Short Run and Long Run Costs

In all types of markets, costs play an important role in the determination of price. Costs also help in the explanation of the behaviour of the farms. In pure market situations, the shapes of the cost curves determine the optimal output so long as the slope of the marginal cost curve is smaller than the slope of the marginal revenue curve.

In economic theory, we have two important costs, viz. Short-run costs and Long-run costs. The short-run period is that period of time during which, one of the factors of production, such as land size is fixed. Long-

run is defined as the period of time during which the quantities of all necessary factors of production including the size of land are subject to change. Costs related to short-run period are called short-run costs. In this period, only some factors of production are fixed, for example, size of the farm and management.

Similarly, the costs incurred over a period long enough to permit changes of all the factors of production are called long-run costs. The shape of the long-run cost curve is U-shaped; it implies that the farm has exhausted all the available economies of scale. Cost considerations are also important for the entry and exit of the farms and regulation of the agricultural industry. In fact, nothing is fixed in the long-run; all factors are allowed to vary including the size of farm and management.

Self-Assessment Exercises

1. Distinguish between two important costs in economic theory.
2. In the short run, the gross returns must cover the variable costs, for the farmer to be in the farm business, otherwise...?

6.4 Definitions of Costs and their Shapes

The total costs of the farm are conveniently divided into two broad groups, viz., total fixed costs and total variable costs, i.e., $TC = TFC + TVC$. Fixed costs generally include the costs that are incurred even if, output is not produced or inputs are not used. Fixed costs remain invariant to the level of production in the short-run but respond to the level of production in the long run. Hence, in the long run there are no fixed costs and these exist only in the short-run. They are not under the control of the manager in the short-run. Fixed costs are the summation of several types of costs, viz., depreciation of machinery, insurance, taxes, interest on fixed capital, rental value of owned land, land revenue, etc. Straight line method is generally followed in working out depreciation. Annual depreciation is computed using the following equation:

$$\text{Annual depreciation} = \frac{(\text{Cost} - \text{Junk value})}{\text{Useful life}}$$

Hence, cost of the machinery is the purchased price, useful life is the number of years the machinery is expected to be used, and junk value is the expected value of the asset at the end of the useful life. It is also called salvage value.

Money invested in the purchase of machinery and equipment has an opportunity cost, which is the interest that accrued on the investment capital. It is not correct to charge the interest on the purchase price of the implement or machinery.

$$\text{Interest on fixed capital} = \frac{(\text{Cost} - \text{Junk value})}{2} \times \text{interest rate}$$

To give the average value of the machinery over its lifetime, costs and salvage value are divided by two, because the asset decreases its value over time. Repairs are not included in general as fixed costs, because of the difficulties in dividing the total repair costs between fixed costs and variable costs. Mostly, repairs are considered as variable costs.

Fixed costs, if expressed as an average per unit of output, they become average fixed costs and computed by the equation:

$$\text{AFC} = \frac{\text{TFC}}{\text{Output (Y)}}$$

Total fixed cost curve is a straight line parallel to horizontal axis as shown in Figure 6.1. Graphically, AFC is a rectangular hyperbola which implies that at all the points on the curve, the level of TFC remains the same (Figure 6.2).

Variable costs are those over which the farmer has control at a given point of time i.e., they can be increased or decreased as per his discretion, on items such as seed, fertilizers, pesticides, feed, etc.

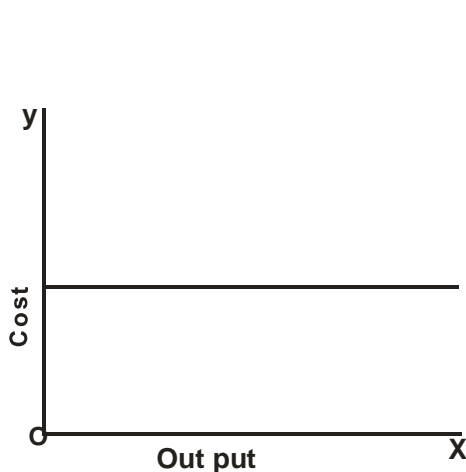


Fig. 6.1: Total Fixed Cost Curve

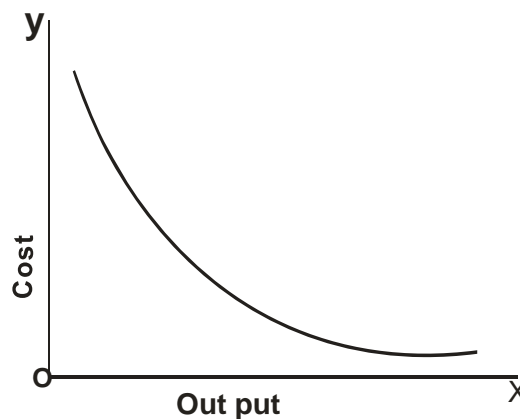


Fig. 6.2: Average Fixed Cost Curve

However, in the short-run, the gross returns must cover the variable costs, for the farmer to be in the farm business. If the variable costs are not covered by the gross returns, the farmer will have no option but to

quit the production of that particular crop enterprise. Total variable costs are obtained by summing up individual variable costs and the average variable costs are calculated from the following equation:

$$AVC = \frac{TVC}{\text{Output } (Y)}$$

Graphically, the TVC has inverse “S” like shape (Figure 6.3).

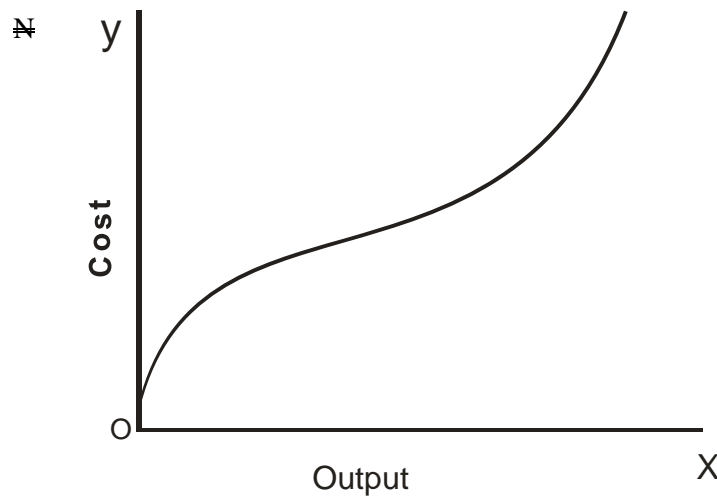


Fig. 6.3: Total Variable Cost Curve

AVC curve is U-shaped and represented in Figure 6.4.

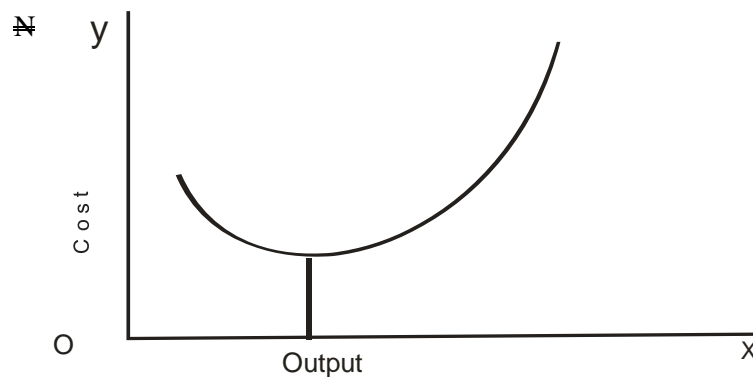


Fig. 6.4: Average Variable Cost Curve

Total cost is the summation of total fixed costs and total variable costs. TC increases as TVC increases, irrespective of the planning period.

$$TC = TFC + TVC$$

TC curve is shown in Figure 6.5.

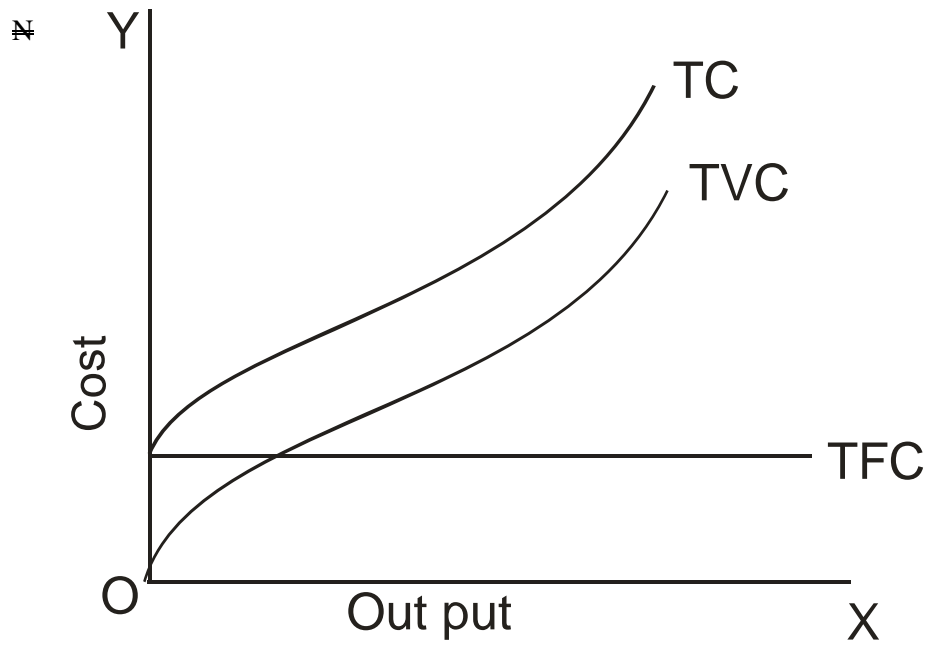


Fig. 6.5: Total Cost Curve

Average Total Cost (ATC) is computed by dividing the total cost by the output and shown in Figure 6.6.

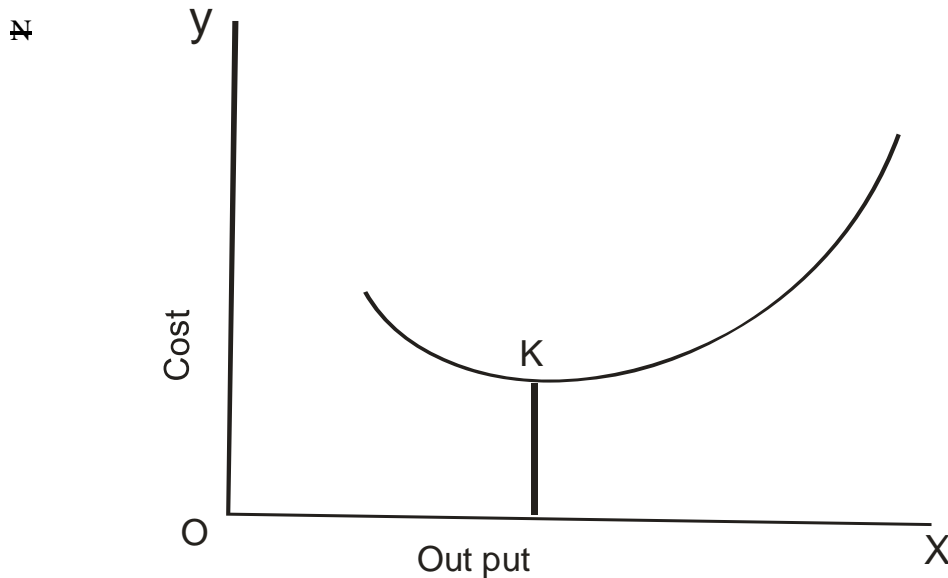


Fig. 6.6: Average Total Cost Curve

$$ATC = \frac{TC}{Output(Y)} \text{ or } \frac{TFC+TVC}{Output(Y)} \text{ or } AFC + AVC$$

Marginal Cost (MC) is the change in TC which results from one unit change in output

$$MC = \frac{\Delta TC}{\Delta X}$$

Graphically it is of the form shown in Fig. 6.7.

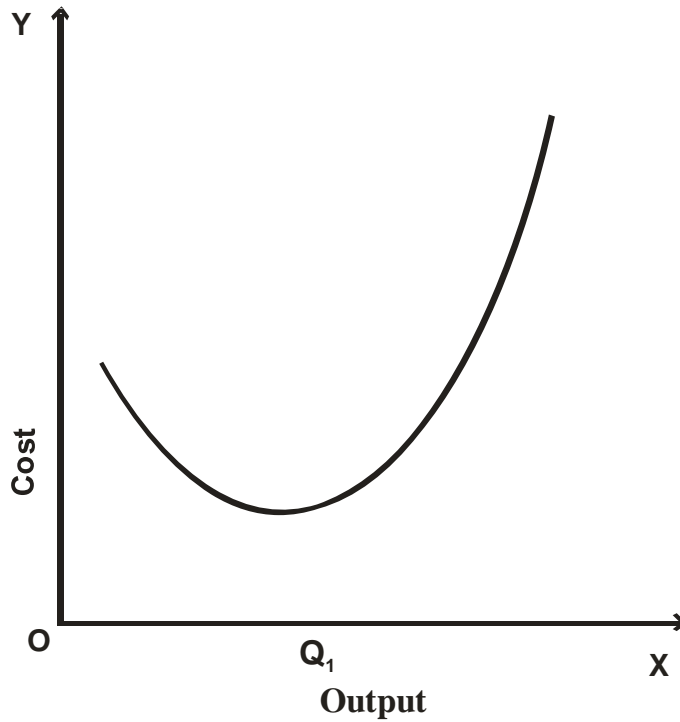


Fig. 6.7: Marginal Cost Curve

6.5 Relationship between Total Cost, Total Variable and Total Fixed Costs

TFC is constant and unaffected by output level. TVC is always increasing first at decreasing rate, later at increasing rate. The TC curve has the same shape as that of TVC and it is always higher by a vertical distance equal to TFC. These curves are represented in figure 6.8.

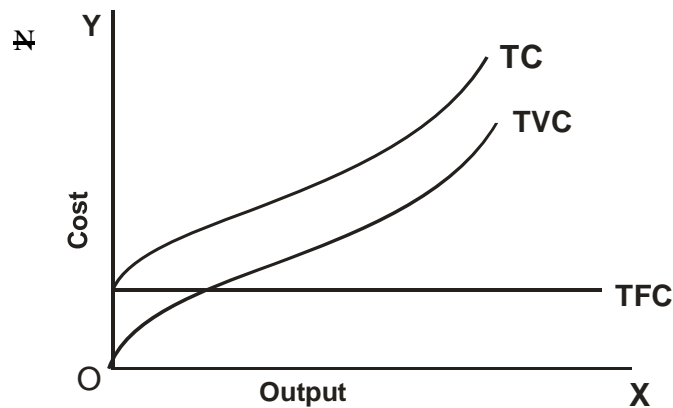


Fig. 6.8: Total Cost Curves

6.6 Relationship between Marginal, Average Variable and Average Total Costs

The shapes of the average and marginal cost curves are furnished in Figure 6.9. AFC is a hyperbola and always declining at decreasing rate as said earlier. The other two average costs, i.e. AVC and ATC are “U” shaped, declining first, reaching a minimum and increasing at higher levels of output. Observe that the distance between the two, i.e. AVC and ATC is not equal. The vertical distance between them is equal to AFC and hence their minimum points are at two different output levels.

MC curve first decreases and then starts increasing continuously. Note that the MC curve crosses both AVC and ATC at their minimum points.

The above graph indicates the said relationship.

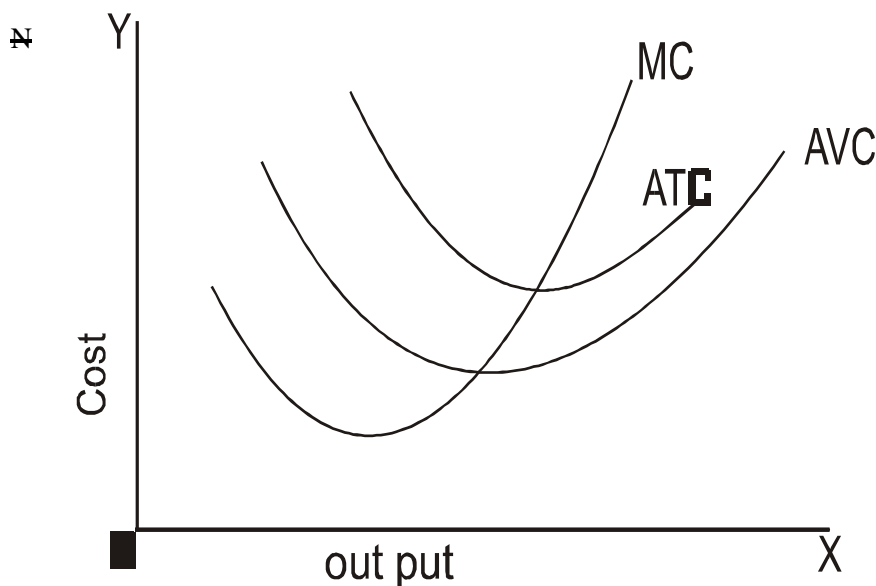


Fig. 6.9: Total, Average and Marginal Cost Curves

6.7 Summary

You have learnt the definitions of the various costs, the shapes of their curves and their relationships.

In this unit, you have learnt that:

- In economic theory, we have two important costs, viz. short-run costs and long-run costs.

- Costs related to short-run period are called short-run costs. In this period, only some factors of production are fixed.
- Long-run is defined as the period of time during which the quantities of all necessary factors of production including the size of land are subject to change.
- The total costs of the farm are split into total fixed costs and total variable costs, i.e., $TC = TFC + TVC$.
- Average fixed cost is computed by dividing the total fixed cost by the total number of outputs.
- Total variable costs are obtained by summing up individual variable costs.
- The average variable cost is the total variable cost divided by the total number of units of output.
- Total cost is the sum of total fixed cost and total variable cost.
- Average total cost is the total cost divided by the total number of units of output.
- Marginal cost is the additional cost incurred by producing an extra unit of output.
- The figures show how the costs are related.

6.8 References/Further Readings/Web Resources

- Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.
- Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

6.9 Possible Answers to Self-Assessment Exercise(s)

1. In economic theory, we have two important costs, viz. Short-run costs and Long-run costs. The short-run period is that period of time during which, one of the factors of production, such as land size is fixed. Long-run is defined as the period of time during which the quantities of all necessary factors of production including the size of land are subject to change. Costs related to short-run period are called short-run costs. In this period, only some factors of production are fixed, for example, size of the farm and management.
2. In the short run, the gross returns must cover the variable costs, for the farmer to be in the farm business. If the variable costs are not covered by the gross returns, the farmer will have no option but to quit the production of that crop enterprise.

MODULE 3

Unit 1	Internal Methods of Acquiring Capital
Unit 2	External Methods of Acquiring Capital
Unit 3	Internal and External Sources of Capital
Unit 4	Agricultural Credit Banks

Unit 1 Internal Methods of Acquiring Capital

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Inheritance
- 1.4 Gifts
- 1.5 Savings: Attitudes of Farmers towards Savings
- 1.6 Family Arrangements: Essentials of Successful Family Partnership
- 1.7 Legal Aspects of Partnerships
- 1.8 Summary
- 1.9 References/Further Readings/Web Resources
- 1.10 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

There are nine methods discussed in this module by which farmers may obtain the capital which they use in their farming business. These are:

1. Inheritance
2. Gifts
3. Savings
4. Family Arrangements
5. Incorporation
6. Leasing
7. Purchase Contracts
8. Vertical Integration
9. Borrowing

These methods can be divided into two categories - internal sources and external sources. The internal sources include items 1 to 4 while the external sources are items 5 to 9. This unit deals with the internal sources.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain inheritance
- explain gifts
- describe savings
- list and explain family arrangements.

1.3 Inheritance

The practice of land tenure system in Nigeria is a major reason why most land is passed from one generation to another through inheritance. Sons inherit the land cropped by their parents and these are passed down from generation to another. In most communities, as the families enlarge, the available land is divided among the many children and therefore land becomes more and more fragmented. Under subsistence farming in the communities, 90 percent of land ownership is through inheritance.

1.4 Gifts

Land is also owned through gifts between two families, friends and mother to son or one type of relation to another. This is common in subsistence farming situations.

1.5 Savings

Capital accumulated through savings (defined as net worth, less gifts and inheritance) forms the foundation of the farm financial structure. Except for gifts and inheritance, savings provide the backbone for farm capital. Savings provide not only capital, as such, but risk-bearing ability (reserves) and demonstrate capacity to earn and save the two very essential components of a strong credit rating.

Farming is big business and big business requires a large amount of capital and a sound financial foundation and framework which savings alone can provide. Few people who are able to save will be successful in commercial farming. The farmer is the one to whom profit derived from farming accrues and, therefore, he must stand the risk of loss.

Funds also are needed for sickness, education and other family uses. Savings must be accumulated by the successful farm family to provide a financial base for all such purposes.

Accumulating any amount of savings takes time for most people. Living standard tends to be upgraded as income increases, which leaves little for saving. However, it is surprising how rapidly wisely invested savings “grow”. Even a small amount saved regularly produces a surprisingly large sum in a fairly short period. Save ₦500 per week and in ten years it will grow to ₦305,000 when invested at 3 per cent, and to ₦327,000 when invested at 5 per cent.

Attitudes of Farmers towards Savings

Farmers save large amounts during their lifetimes. It is doubtful if any occupational group in the economy saves as large a proportion of its income in the developed world. Much of these savings are “forced” by the nature of the business. The farmer must have capital to be successful and this practically forces the farm family to save. It is often said that farmers live poor but die rich. This is because they keep investing in more modern, more efficient capital till they die. Would farmers save as much if it were not for this “forced savings” aspect of agricultural production? The recommendation is often made that larger loans be made to farmers so they will not have to save so much. On the other hand, it is apparent that well-established farmers continue to save when additional capital is not a necessity in the business. What are farmers' attitudes on savings?

A large proportion of farmers feel that a greater proportion of income should be devoted to investment in farm business than consumption. However, family cycle has a great influence on the farm activities and plans. Older farmers tend to allocate more of the income to consumption than into farm business. The reverse is the case for younger farmers.

1.6 Family Arrangements

Family arrangements are of considerable importance in acquiring capital to farm, particularly for beginning farmers. Where parents or family members are able, gifts or loans are made to the beginning farm family to assist in providing capital. In other cases, assistance in acquiring capital to farm is provided through formalised agreements, such as father-son-partnerships and rental arrangement.

The importance of family agreement is increasing. Extension of Social Security to farmers in United States of America for example, encourages many to reduce their farming activities so as to gain full social security benefits. Family arrangements to accomplish this objective are becoming more frequent. Moreover, with larger and fewer farms, the beginner is becoming increasingly dependent upon family assistance in acquiring a farm to operate.

Father-and-son agreements are the most common forms of family arrangements. They provide a means whereby a son or son-in-law with limited capital can work into the farm business. From the father's viewpoint, such an arrangement often is desirable since he is able to "ease up" a bit. With the decrease in the amount of manual labour, an older farmer can perform comes an almost certain decline in farm upkeep and income. An agreement with a son, therefore, may be welcomed by the father not only to help with the work but to help maintain a vigorous and profitable business.

The agreement also has advantages for the younger man, offering him an opportunity to start farming with less capital than is possible with any other method. By working with his father, he can profit from mature advice, gradually develop his knowledge of agriculture and business, and his management ability. Where the father is nearing retirement and other heirs are not involved, an agreement facilitates transfer of the farm to the son, enabling him to start farming "on his own" with a more adequate unit than might otherwise be possible.

Essentials of Successful Family Partnership

There are ten essentials for successful father and son farm partnerships. These are summarised as follows:

1. ***Desire of the son and his wife to farm.*** The best accomplishments in life are made by individuals who like their work. Farming is not easy, and to be a successful farmer, he and his wife must enjoy their profession as an offset to the hard work and long hours involved.
2. ***Satisfactory living conditions for two families.*** Separate living accommodation should be provided, if at all possible, to allow individual freedom and to eliminate a source of possible friction.
3. ***Ability to get along with each other.*** The elder couple should have a determination to recognise that the younger couple will do things differently and have different ways. The young folks should respect their elders and their judgment.
4. ***Belief that a farm partnership is desirable.*** Do all parties concerned believe the partnership will enable the two families to make better progress and be happier than if they operated independently?
5. ***Adequate size of farm business.*** Is the farm large enough to provide employment and an adequate living for the two families? If not, can it be enlarged sufficiently through more intensive operation, or by renting or buying additional land?
6. ***Good farm management.*** If good farm management is not followed, the agreement probably will not succeed.

7. **Knowledge of farm business by son.** The son should have knowledge of the business of farming and of the individual farm business in which he is to become a partner.
8. **Good business judgment in the use of money.** Many young people have “too big ideas” and make investments that plague them for years. Excessive risks should be avoided. The young should seek the counsel of their elders in financial affairs.
9. **Partnership in the entire farm business.** To avoid trouble, participants in the business must be interested in the conduct of the entire farm enterprise.
10. **Good partnership agreement.** A sound agreement which fits the farm and the partners is essential. A written agreement helps prevent misunderstanding.

Self –Assessment Exercises

1. Describe farmers’ attitude towards savings.
2. Mention three legal aspects of partnership.

1.7 Legal Aspects of Partnerships

In forming partnerships, the partners should know and understand what is involved and give proper attention to legal aspects. Each person entering a partnership assumes considerable responsibility for actions of the partner. A partner may sell property of the partnership, make contracts for the business, and create partnership debts without consent of other partners. Moreover, each partner has unlimited liability for suits against the partnership.

Usually, these things are relatively unimportant in father-and-son partnerships, but provision should be made for handling eventualities; perhaps a way to ensure that difficulties do not arise. Since laws governing partnerships vary from State to State, a qualified attorney should be employed to help prepare the partnership agreement, incorporating proper safeguards. Adequate insurance should be carried to cover insurable liability claims against the partnership.

Death of either partner automatically terminates a legal partnership. This possibility should be recognised and the method of dissolving the partnership in such event should be included in the agreement.

1.8 Summary

In this unit you have learnt that:

- As a result of the land tenure system, most land is passed from one generation to another through inheritance.
- It is common in subsistence farming situations that land is given as gifts between two families, friends and mother to son or one type of relation to another; savings provide the backbone for farm capital and also serve as a risk-bearing ability (reserves). However, older farmers tend to allocate more of the income to consumption than into farm business. The reverse is the case for younger farmers.
- The importance of family agreements is on the increasing e.g. father-son-partnerships. There are ten essentials of successful family partnerships.
- There are also some legal aspects of the family partnerships.

In addition, you have learnt that the farmer can acquire capital through inheritance, gifts, savings and family arrangements.

1.9 References/Further Readings/Web Resources

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

1.10 Possible Answers to Self-Assessment Exercise(s)

1. It is doubtful if any occupational group in the economy saves as large a proportion of its income in the developed world. Much of these savings are “forced” by the nature of the business. The farmer must have capital to be successful and this practically forces the farm family to save. It is often said that farmers live poor but die rich. This is because they keep investing in more modern, more efficient capital till they die. Would farmers save as much if it were not for this “forced savings” aspect of agricultural production? The recommendation is often made that larger loans be made to farmers so they will not have to save so much.
2. **Legal aspects of partnership are:**
 - a. Each person entering a partnership assumes considerable responsibility for actions of the partner.
 - b. A partner may sell property of the partnership, make contracts for the business and create partnership debts without consent of other partners.
 - c. Moreover, each partner has unlimited liability for suits against the partnership.

Unit 2 External Methods of Acquiring Capital

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Incorporation
- 2.4 Renting
- 2.5 Purchase or Purchase Contracts
- 2.6 Vertical Integration and Contract Farming
- 2.7 Borrowing
- 2.8 Summary
- 2.9 References/Further Readings/Web Resources
- 2.10 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

In this unit, you will learn about the five external sources of acquiring capital by the farmer.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain incorporation
- explain leasing
- explain purchase contracts
- describe vertical integration
- discuss borrowing.

2.3 Incorporation

Forming a corporation provides another method of acquiring capital to farm. A corporation is a legal entity authorised by State law capable of doing business, making contracts, borrowing money, and the like, the same as an individual proprietor. The procedure for forming a corporation is outlined in the law and should be followed exactly. For this and other reasons, services of a competent lawyer are essential for incorporating a business.

Individuals who form a corporation are its owners and are issued certificates representing shares to show the interest each holds in the corporate assets. The shareholders elect directors to represent them in business policy and management decisions. The directors in turn employ officers who operate the business according to policy established by the directors.

Incorporation is a possibility in any business of reasonable size. Many family farms are large enough to at least consider incorporating. However, only larger farms have found incorporation advantageous. Incorporation attracts taxes at both state and federal levels.

When a corporation is formed to operate a farm business, it takes the place of the farmer as owner and operator. An individual may manage and operate the farm like any farmer, but he does so as an employee of the corporation, not as an individual entrepreneur.

Advantages of Incorporation

A corporation provides a means by which a group of individuals may pool their funds and operate a business. Members of a family may organise a corporation to operate the home farm and to facilitate its transfer to a son or a son-in-law without disrupting the business. Other individuals may also form a corporation to carry on a farming operation. For example, two or more families with inadequate capital to farm efficiently on an individual basis may use the assets they have to advantage by pooling them in a farm corporation.

In addition to serving as a means of obtaining capital, incorporation of the farm business may serve to hold the unit together and permit continuity of operation from one generation to the next. This feature assumes added importance as the size of business increases. Should one shareholder of an incorporated business die or decide to sell out, there is no need to break up the business, as in a partnership. The stock may merely be transferred to a new owner. This ability to transfer ownership of undivided interests provides an easy means for children and others to buy into a farm business. It also facilitates estate planning by permitting parents to divide and transfer estates without reorganising the business.

Some fringe benefits may be obtained through incorporation with advantages in terms of benefits and taxes. Since social security benefits are based upon earnings of individuals in the United States of America, as such, it may be advantageous for a farm operator to receive a constant salary even though the corporation may show a loss. The availability of profit-sharing and pension plans may favour the corporate form of business in some instances. For example, with a qualified pension plan, some corporate profits can be used to provide retirement income for employees even though they are stockholders. The corporation pays no tax on earnings applied to the pension plan, and the employee is taxed only when he receives the retirement benefits. Somewhat similar benefits accrue from medical payment plans, employee death benefits and group life insurance.

Disadvantages of Incorporation

There are some problems or disadvantages associated with incorporating a farm business which should be carefully and thoroughly considered. For example, unless proper safeguards are included in the legal framework, the business might not be managed in the best interests of minority stockholders. Some expenses are involved in incorporating, and a corporation may pay certain annual fees and taxes which are not required of other types of business organisations. Furthermore, some expenses are involved in maintaining records of the corporation and in filing the corporate tax returns. Annual meetings must be held, directors and officers elected, and an annual report of the business filed with the appropriate government body.

2.4 Renting

Renting or leasing is a common way of obtaining additional capital for farming. Tenancy usually is thought of as the second rung on the ladder of farm ownership. A young farmer can work, learn and save until he has enough know-how and capital to obtain and manage a line of machinery and livestock. With this, he is in the position to rent a farm and begin operating on his own. And, of course, renting does not always stop when farm ownership is attained. Many lending farmers and ranchers, who own considerable land, rent additional acreage to utilise more efficiently their managerial ability, the land, machinery and equipment they own.

Types of Leases

Leases are usually classified according to the kind of rent paid. Most of them fall into three general groups: the crop-share lease, the livestock share lease and the cash lease. With share leases, a share of the crop or livestock production is paid to the landlord as rent. With a cash lease, rent agreed upon is paid in cash. The various types of leases may be combined or otherwise modified in renting a farm. A common method is to give a share of the grain crops as rent.

The crop share lease is the most common type of rental arrangement. With the crop-share lease, the landlord usually provides the land and improvements and pays related taxes and other expenses, while the tenant pays most of the operating expenses and furnishes power, machinery, labour and livestock. Some expenses such as seed and fertiliser may be shared with the landlord. Crops produced are shared as agreed upon in the lease.

For farms rented under a livestock-share lease, the tenant and landlord customarily share crops and livestock production as well as some of the expenses. The landlord usually furnishes the land, buildings and other

improvements; the tenant furnishes the machinery, power and his own labour. The tenant and landlord commonly own the livestock jointly and share the annual expenses of crop and livestock production. The livestock is most often owned on a 50-50 basis and expenses and income are shared in the same proportion.

Farms rented by cash lease tend to be used most frequently in areas where yields are relatively stable and where production involves a relatively small amount of risk and uncertainty. They also are frequently used for part-time or residential farms. With cash leasing arrangements, the landlord is paid a specified cash payment and usually furnishes the land, buildings and other improvements. The tenant furnishes all other items required for production, including labour, machinery, livestock and operating expenses. The entire production of crops and livestock belongs to the tenant.

The concepts of cash and share rent are sometimes combined in what is called *standing rent*. A fixed rent is agreed upon but in place of cash, payment is made in a fixed measure of products, such as one-third bale of cotton, 5 bags of maize or tins of palm oil. The naira amount of rent the landlord receives varies with price of the product, as it would with share rent, but the amount of product he will receive is known in advance. Thus, the landlord has greater security in years of low yield, while the tenant makes more profit in years of high yield.

On cocoa farms in Western Nigeria, the renter makes away with most food crops like cocoyam, yam, banana and plantains but share palm oil produced with the landlord and pays cash for the cocoa beans proportionally as stipulated in the agreement.

Advantages and Disadvantages of Obtaining Capital by Renting

There are several advantages and disadvantages to renting, as there are with all methods of obtaining capital. The advantages for the tenant include the possibility of obtaining control of a large amount of capital with relatively little risk, the possible benefit from landlord managerial assistance, and the possibility of having a more nearly adequate farm unit which will facilitate efficient production. On the other hand, when one leases a farm, uncertainty of tenure is involved, living accommodations and farm improvements frequently are inadequate, rental arrangements may not contribute to efficient-maximum production, and the cash or share rent must be paid. This rent must compensate the landlord for any other assessments on the property, maintenance and depreciation of improvements, a competitive or opportunity return on investment and the risk and uncertainty associated with his investment. Thus, while the tenant avoids these costs and responsibilities by renting, he pays someone else to assume them.

2.5 Purchase or Purchase Contracts

If the buyer has sufficient funds, he can pay for the property fully and all documents signed and handed over to him. This is the most common in Nigeria. A purchase contract provides another method of supplementing one's capital. The contract may be known by various names such as contract for sale, conditional sales contract, or land contract, depending upon local terminology and the type of property involved in the transaction. Such an instrument is used in transactions where the down payment is too small for the buyer to obtain title by financing part of the purchase price with a mortgage. For example, roughly 50 percent of the purchase price of real estate may be required as a down payment to obtain financing with a mortgage.

Terms of a Purchase Contracts

A purchase contract is a written agreement whereby one party agrees to convey land and sometimes chattel farm property to another party for an agreed price. Possession of the property passes to the buyer while deed to the property remains with the seller, to be delivered at some future date or upon payment of a specified amount. The contract usually provides for the buyer to keep up or make improvements on the farm. Where livestock are involved, provision usually is made for all livestock raised or purchased and kept on the farm to be considered as replacement equipment, legally belonging to the seller until terms of the contract have been fulfilled. As a general rule, the buyer pays all expenses, including all taxes and property insurance after a specified date. The kind and amount of insurance usually is specified, with the loss-payable clause being in the name of the seller. It therefore implies that only the rich can make such purchases unless the buyer has access to bank financing. If this is not possible, another alternative is purchase contract.

Advantages of Purchase Contracts

- a) From the buyers' viewpoint
The purchase contract provides the buyer a means of low-equity financing. By buying on contract, a family can, acquire a farm at an earlier age than by waiting to accumulate capital necessary to purchase with the aid of borrowed funds. It enables the family to acquire a farm at a lower price in a period of rising farm prices than if they waited to accumulate capital to buy outright.
- b) From the viewpoint of the seller
The contract may facilitate selling the farm at a higher price than otherwise would be possible. The seller retains an investment in a business with which he is familiar, over which he has some

control, and from which he can receive regular periodic payments.

Disadvantages of Purchase Contracts

Since legal title remains with the seller, the buyer feels some sort of insecurity of ownership. Total payments are relatively heavy for the buyer after considering costs of repairs, improvements, taxes, insurance costs, etc. If the buyer is unable to meet the instalment, they can be cut off from the farm.

Another disadvantage of the purchase contract is the tendency for assets of buyer and seller to become “frozen” during the first few years the contract is in operation. During this period, it is difficult for the buyer, in the event he wishes to do so, to sell accumulated equity. Due to relatively heavy payment schedule, operating capital may be further depleted such that the buyer may be unable to follow good farm management practices.

2.6 Vertical Integration and Contract Farming

Vertical integration means bringing together under central management two or more of the links in the chain of production and marketing. A farmer whose operations are vertically integrated shares with one or more related businesses—such as his supplier, processor, or distributor some of his managerial decisions in production and marketing. In return, the supplier, processor, or distributor involved (the integrator) provides financing and assumes the associated risks. This linking together of two or more stages of the production-marketing process often is accomplished through contractual arrangements. Thus, it is sometimes called contract farming. Since other types of contracts are frequently encountered in agriculture, we use the term vertical integration to avoid confusion.

Farmer-businessman arrangements can vary from connections only slightly closer than conventional open-market relationships to full ownership and management of the farm by the associated business. However, the degree of vertical integration thus far in agriculture generally falls between these extremes, but usually involves varying degrees of financing the enterprise or operation. Therefore, vertical integration is another way for a farmer to obtain capital with which to work.

Vertical integration is not new in agriculture. Contracts of various types have been used for a long time with cannery crops, sugar beets and the like in developed world. However, an arrangement where the supplier,

processor, or distributor takes over the farm production operation and “stacks” it on top of his normal function is relatively new.

The relative importance of vertical integration or contracting with nonfarm businesses varies considerably among commodities. For some commodities, only a small proportion of farm output is produced under vertical integration, for others the proportion is nearly 100 percent. For example, roughly 95 percent of the broilers is produced on this integrated basis. Integration and contracting trends in livestock are much less far advanced but are still evolving. Integration, either by contract or by internal coordination of stages of production, develops when regular farm production fails (a) to provide the needed market outlet for a supplier of inputs, or (b) to provide farm products of the proper specifications at reasonable prices for marketing firms.

Advantages of Obtaining Capital through Integration Contracts

As in the case with any method of acquiring capital, vertical integration has several advantages and disadvantages. Some of the advantages are:

- a) The integrator (businessman) assists with or carries full responsibility for management of the enterprise covered in the contract. Specialised management, with full information on latest scientific developments in feeding and other practices, probably facilitates more efficient production.
- b) Risks are shared with, or completely transferred to the integrator. While shifting risks does not remove them, it makes them more manageable by consolidation in the hands of the integrator.
- c) With more capital, the size of the enterprise can be increased, contributing to greater efficiency in use of labour and equipment.
- d) Specialised management and the larger amount of capital facilitates “continuous” production – as with broilers where more than four batches may be produced each year – thereby making more efficient use of buildings, equipment, capital, labour and management employed in the enterprise.
- e) Transfer of some, or all, management responsibility for an enterprise to the integrator leaves the farmer more time for his other enterprises. From the specialised management of the enterprise under contract, he may also gain useful ideas or knowledge on management of his other enterprises.
- f) Enlarging an enterprise by contracting may require additional labour. Where the operator and family members are employed, they may be able to earn a higher income.
- g) For families with limited resources who enjoy rural life, contract farming offers an opportunity to live and work in a rural setting without having to provide all the capital and carry all the risks involved.

- h) With a larger enterprise, better breeding stock and seed varieties may be used. These, coupled with specialised management familiar with market demands, result in orderly marketing of a higher quality product that suits the needs of the public.
- i) With a large volume of business, the integrator is able to use highly specialised equipment in production or processing which would not be possible for the individual farmer.
- j) Having partial or complete management control of production phases, the supplier or the processor can better coordinate various phases of the production-marketing process, thereby contributing to efficiency in use of resources and management.
- k) Greater efficiency in use of supplier-producer-processor resources and management, coupled with advantages such as higher quality products, contributes to an overall net gain either in terms of higher income for parties involved in the production marketing chain, or to a higher quality product at a lower cost for the public.
- l) Judging from developments in industry, integration in agriculture might facilitate more orderly production and marketing of agricultural products. Real possibilities of gearing production to demand may be inherent in contracts between processors and farmers, or groups of farmers.
- m) Vertical integration probably has enlarged the number of farmers who can obtain financing. Some farmers unable to secure financing from other sources probably can obtain capital with which to work by means of a contract.

Seldom if ever are advantages gained without a price. One cannot “have his cake and eat it too.” Thus, a number of disadvantages are also involved in integration; their importance, of course, depending upon the degree of integration provided by the contractual arrangements.

Disadvantages of Obtaining Capital through Vertical Integration

- a) With integration contracts which give full control to the integrator, the farmer gives up all his freedom in making management decisions pertaining to the integrated enterprise. In such cases, he does not gain control of capital thus acquired, but merely has it to work with. With broiler-type contracts, for example, where the integrator retains title to the birds and provides operating capital, he also makes the management decisions.
- b) The price a farmer pays for shifting some or all price and production risks and management to the integrator may be reflected in lower returns.
- c) When management decisions are transferred to an integrator, the producer may be little more than a hired hand.

- d) Competition among suppliers has been a major stimulus to the rapid growth of vertical integration. Feed dealers, for example, use contracts as a method of increasing sales. Credit used as a sales tool may be overextended.
- e) The farmer entering a contract probably gives up his right to “gamble” on the market. He probably will not have much opportunity to “get rich quick”.
- f) Vertical integration may complicate farm business planning and related finances.
- g) If contractual arrangements require the farmer to give highest priority to the vertically integrated enterprise, other enterprises may suffer and result in less net income than otherwise might be the case. In such event, credit to finance the non-integrated enterprises may be more difficult to secure.

Self-Assessment Exercises

1. What do you understand by vertical integration?
2. Write short notes on the advantages of borrowing.

2.7 Borrowing

The word “borrow” means to receive something with the understanding that it or its equivalent will be returned as agreed upon. Stated another way; borrowing means the ability to command capital or services currently for a promise to repay at some future time. In terms of money, borrowing involves obtaining a certain amount of funds to be repaid as specified in the note.

The word “credit” comes from the Latin word “credo” meaning “I believe”. Hence, credit is based upon confidence. When one borrows money, the loan is based upon confidence in the future solvency of the person and in his repaying the loan as per agreement. In this sense, credit means ability to command the capital of another in return for a promise to pay at some specified time in the future.

While credit has a somewhat technical meaning of its own, it is used in financial circles and writings as meaning the same as borrowing. This synonymous usage probably has come about for convenience’s sake. The word “credit” is short and easy to use. Holding strictly to technical meanings often involves using two words rather than one. For example, a phrase might read “use of borrowed funds”. It is somewhat more convenient to say “use of credit”.

Borrowing probably ranks next to saving or using one's own capital as a means of obtaining capital to farm. Few commercial farmers operate without using credit. Some have adequate finances of their own but use credit at times throughout the year rather than disrupt investment programs or other use of owned capital.

Using credit as a means of obtaining control of resources is similar in some respects to renting. When funds are obtained by borrowing, interest is paid for use of the capital; while, with a lease, rent is paid for use of the capital. Both borrowing and renting involve employment of capital for a period of time. However, the use of credit permits greater flexibility than renting. Credit can be used to acquire any type of resource or service needed by the farmer, while renting usually is employed to acquire use of fewer types of resources, the most common being farm real estate. Credit permits acquiring varying amounts of a resource according to needs of the farmer, while renting tends to involve fixed amounts or "blocks" of resources, such as a piece of land or a whole farm.

Borrowing involves more risk of losing owned capital than does renting. With renting, the maximum payment which can be demanded is the share or cash rent; this is somewhat comparable with the interest payment on borrowed funds. With share rental arrangements, the payment is automatically cut in case of low production or prices. With borrowing, however, the payment generally includes in addition to a fixed interest charge, part or the entire principal borrowed. If the principal is lost, the borrower may have to liquidate some of his own capital to repay the loan.

Except for special cases, some properties or assets must be owned before a loan can be obtained. Since most lenders do not loan their own money, laws or regulations under which they operate require them to obtain the borrower's pledge of security for a loan. Usually, the security is some specific property which can be sold to liquidate the loan if it is not repaid as per agreement. Where the loan is not large and where the individual has a good credit rating, only the signature may be required; in such cases the borrower, in effect, pledges all his assets as security. The general intent of the law and regulations is that security pledged be adequate to repay the loan even if it must be sold under unfavourable circumstances; this provision seems reasonable.

Advantages of Borrowing

The use of credit on the other hand, has definite advantages. If farmers were denied credit altogether and forced to rely on their savings, two undesirable results would occur immediately. Tenant farmers who have been using borrowed capital would be forced to give up farming and hire out as labourers or go into some other line of work. Owner-

operators on mortgaged farms would have to give up the ownership of their homes and farmland; they would be tenants again with all the insecurity that goes with this arrangement. Furthermore, those contemplating the step from hired hand to tenant, or from tenant to owner, would have to postpone this action either indefinitely or until they had accumulated through savings the amount they otherwise would have borrowed. In fact, the amount of capital required in farming is in many instances so large that hired hands and tenants would be forced under these circumstances to give up any hope of ever achieving a higher place on the agricultural ladder.

Credit is desirable also because the people who own land and have funds to lend are often not operating farmers. The capital-owning group is made up of older people, retired farmers, widows, endowment funds, estates, banks, and insurance companies, as well as more wealthy individuals with money to lend. These various agencies and individuals are in no sense operating farmers. Operating farmers-fitted by training, experience, and age to carry on crop and livestock production, do not, as a rule, have the necessary capital required to operate a farm. The competent young farmer between the ages of 20 and 35 with a family to support has everything needed for farming except capital. The individuals who have capital, on the other hand, oftentimes do not have the physical ability, training and experience which the young farmer has. Thus, the two are interdependent. Indeed, the cooperation of these two groups, management and capital, makes for successful farming; either alone would fail.

At this point, it might be argued that the capital group could rent capital to young farmers in the form of land, equipment and livestock. This practice, as pointed out above, is followed to a large extent with land. The policy might be extended more generally to include equipment and livestock and thereby avoid major uses of farm credit. But land, the item best adapted to the rental principle, sometimes suffers when operated under tenancy. Too often the absentee landlord is unable to give his farm the proper attention, and a discouraged tenant, rundown buildings, erosion, weeds, and other objectionable developments result.

Livestock, equipment, and operating expenses are capital items not as easily adapted to the rental process as land and buildings. Owners of livestock and equipment find it exceedingly difficult and costly to provide the supervision necessary for the rental of these items. It is still more difficult for the farmer to make arrangements for the payment of operating expenses such as seed, taxes, labour, and fertiliser unless he has savings or uses credit. The landlord frequently is willing to take a share of the crop in payment for the use of his land, but the labour must

be paid in cash weekly. Thus, it is evident that renting or hiring materials does not provide a satisfactory substitute for the use of credit.

Credit makes it possible for hired men to become tenants, and for tenants to become owners. Moreover, credit makes it possible for farmers to take advantage of new machines, good seed, fertiliser, livestock and labour, all of which enable the farmer to organise and operate his farm on a more profitable basis.

The trouble is not with credit but with the way it has been used in areas of high risk and in times of high prices and with its abuse in individual cases. Properly used, credit can be of great assistance and farmers should think twice before trying to get along without it. Where farmers try to be financially independent, they hamper their progress. By attempting to do everything on their own they must restrict their operation. If they never give their banker a chance to help, they lose the advantage of his advice and counsel, as well as the benefit from credit he might extend to them. A carpenter without tools would make little progress. The farmer needs the credit tool in his kit to make maximum progress.

Disadvantages of Borrowing

Fear of debt has been a factor in management decisions of farmers for a long time. In some cases, farmers expressed this fear by feeling it was bad to be in debt. They felt debt was something to be avoided at almost any cost. This view was expressed long ago by Shakespeare where he had Polonius say:

*Neither a borrower nor a lender be,
For loan often loses both itself and friend,
And borrowing dulls the edge of husbandry.*

This attitude continues to be held by some farmers today; these type of farmers borrow only after they run out of money and have to borrow.

The primary disadvantage of borrowing is the risk of loss associated with use of credit. One never borrows money with the expectation that a loss will be sustained. A reputable lender never makes a loan which he thinks will result in a loss. However, farming is a risky business and the risk of loss is ever present. Due to crop failure, low prices, insects, disease, and the like, income may fall to a fraction of that anticipated. The results may be disastrous unless the borrower has the risk-bearing ability needed to withstand such adversity.

Closely related to the risk disadvantage is the problem of meeting payments as at when due. Loan proceeds are used in the business and are not always available to meet loan payments. In fact, loan proceeds

used to buy land never are available to repay the loan; payments must be made from net income.

A third problem involved in using credit is determining whether or not it will pay to borrow. Borrowing involves repaying not only the principal but also the interest charged for use of the funds. The borrower will be at a disadvantage unless, by using the credit, net income is increased at least enough to cover the interest on the loan. Each of these three points - risk, repayment of loans and income related to use of credit, is considered in some detail in the subsequent sections.

Borrowing can be avoided. The way to avoid borrowing is to use the methods of acquiring capital discussed above or hire the items that would otherwise be purchased with the use of credit. A farmer may hire his land ploughed, his grain and soybeans combined, his corn picked, or he may arrange to rent the equipment and do the work himself. Finally, he may contract with the owner of range livestock to feed them out on shares. To escape the risk of borrowing, he may contract with the owners of land, livestock, and equipment to give them a share of the proceeds or a fixed cash rental for the use of the desired items for a limited time. The difference between owning and renting is largely a matter of time and credit. The owner with the use of credit purchases the right to use the land indefinitely; the renter purchases the right to use land for a short period, usually one year. This policy of renting and hiring for short periods to avoid the use of credit has much to commend it, because agriculture has such a large element of crop and price risk that is beyond the control of the individual farmer.

2.8 Summary

The unit has exposed you to the five external sources of capital namely:

- Incorporation
- Leasing
- Purchase contracts
- Vertical integration and
- Borrowing.

In this unit, you have learnt that:

- A corporation is a legal entity authorised by state law and is capable of doing business, making contracts, borrowing money etc., just as an individual proprietor.
- When a corporation is formed to operate a farm business, it takes the place of the farmer as owner and operator.
- Leases are usually classified according to the kind of rent paid. Most of them fall into three general groups:
 - the crop-share lease,

- the livestock-share lease, and
- the cash lease.
- If the farmer has sufficient funds, he can pay for a piece of land or other property fully and all documents signed and handed over to him.
- He can also acquire it on a contract basis by a down payment of 50% of the purchase price.
- The purchase contract provides the buyer a means of low-equity financing.
- Vertical integration means bringing together under central management two or more of the links in the chain of production and marketing.
- There are, however, many advantages and disadvantages of this method.
- Borrowing, which means the ability to command capital or services currently for a promise to repay at some future time, is another method of acquiring capital.
- Credit affords the farmer borrower to expand his business, makes it possible for the farmers to take advantage of new machines, good seed, fertiliser, livestock and labour, all of which enable the farmer to organise and operate his farm on a more profitable basis.
- However, the primary disadvantage of borrowing is the risk of loss associated with use of credit

2.9 References/Further Readings/Web Resources

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2.10 Possible Answers to Self-Assessment Exercise(s)

1. Vertical integration means bringing together under central management two or more of the links in the chain of production and marketing. A farmer whose operations are vertically integrated shares with one or more related businesses - such as his supplier, processor, or distributor some of his managerial decisions in production and marketing. In return, the supplier, processor, or distributor involved (the integrator) provides financing and assumes the associated risks. This linking together of two or more stages of the production-marketing process often is accomplished through contractual arrangements. Thus, it is sometimes called contract farming.
2. **Advantages of Borrowing:**

The use of credit on the other hand, has definite advantages. If farmers were denied credit altogether and forced to rely on their savings, two undesirable results would occur immediately. Tenant farmers who have been using borrowed capital would be forced to give up farming and hire out as labourers or go into some other line of work. Owner-operators on mortgaged farms would have to give up the ownership of their homes and farmland; they would be tenants again with all the insecurity that goes with this arrangement. Furthermore, those contemplating the step from hired hand to tenant, or from tenant to owner, would have to postpone this action either indefinitely or until they had accumulated through savings the amount they otherwise would have borrowed. In fact, the amount of capital required in farming is in many instances so large that hired hands and tenants would be forced under these circumstances to give up any hope of ever achieving a higher place on the agricultural ladder. Credit is desirable also because the people who own land and have funds to lend are often not operating farmers. The capital-owning group is made up of older people, retired farmers, widows, endowment funds, estates, banks, and insurance companies, as well as more wealthy individuals with money to lend. These various agencies and individuals are in no sense operating farmers.

Unit 3 Internal and External Sources of Capital

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Internal Sources of Finance
- 3.4 External Sources of Finance: Non-Institutional and Institutional Sources
- 3.5 Summary
- 3.6 References/Further Readings/Web Resources
- 3.7 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

Agricultural finance derives its role in agricultural development theory from a fundamental conception. The conception is that of agricultural development as a process which involves adoption of new and better agricultural practices by farmers. Most of these practices have to be purchased by way of inputs and using financial resources in agricultural business.

Agricultural credit encompasses all loans and advances granted to borrowers in order to finance and service production activities related to agriculture. Farm credits which could be for production or meeting current or long-term capital expenses of the farmers usually fall in time-related categories of short, medium and long-term finance.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain internal sources of finance
- explain five non-institutional external sources of finance
- explain ten institutional external sources of finance.

3.3 Internal Sources of Finance

Internal finance can be viewed as the mobilisation of resources within a firm for use in financing agricultural activities or better put as, the mobilisation of money obtained from retained earnings for the financing of agriculture. Internal sources of finance include the following:

a. Retained Profit/Earnings

This is one of the most important sources of finance and one that is most often ignored by agribusiness managers. The managers

may be aware of these funds but may not know how to use them. Retained profit is a very useful source of long-term finance, as long as the agribusiness is making profit after meeting all its obligations.

b. Sale of Assets

A farm can generate funds for financing new activities or paying off debts by selling its assets such as machinery, fixtures and fittings, vehicles, etc. The farm may sell some assets and lease when he needs them. This means it may sell its assets and rent it from the new owner. It may mean paying more money in the long run but it may provide quick cash to avoid crises.

c. Reducing Stocks

Stock is a type of asset which can be sold to raise finance. Stock could be the business holdings of raw materials, semi-finished products and finished products. In the case of farms, it may be farm inputs, harvested crops which the business has not yet sold.

Business usually holds back stock and this can be useful if consumer demand is expected to rise or if farm products prices are expected to increase in the near future. Stocks may pile up during economic slowdowns as goods are not sold. Stocks are not usually a source of large amount of finance. Large stockpiles could mean that there is no demand for the product and this might make reducing stocks very difficult. It involves a lot of speculations about the fluctuations in prices of the goods that the farmer may want to sell to raise funds.

d. Equity Capital

These are funds obtained by the business through profits. It is made through the investment of more money by the owners or through taking into the business additional people who are willing to invest their funds in it. The earnings are not distributed but reinvested. Equity capital may be the only alternative for small or new business to increase their capital funds. At times, owners are not anxious to sell equity to other people because they do not want to lose complete control of their businesses.

e. Common Stock

For small businesses, this may mean selling shares of stock to people who are known to the present owners such as employees and people in the community who are interested in investing funds in promising businesses. This is the most common form of equity capital. Common stock is usually voting stock, which means the owners of common stock have say in the management

decisions of the business. Larger businesses who may decide to sell stock to the public will require the services of investment brokers, auditors and lawyers.

3.4 External Sources of Finance

The major sources of external credit can be classified into institutional or formal and non-institutional sources.

a. Non-Institutional Sources

The non-institutional or informal sources are those which do not have any uniformity in their lending procedure, their interest rate or their collateral requirement.

Loans from such sources are usually made directly to the borrower by the lender and are prevalent in areas where individuals are quite familiar with and share confidence in one another. In other words, the lender knows the borrowing farmer and reasonably vouch-safe for his (borrower's) integrity.

The relative ease of obtaining the loans devoid of administrative delays, non-insistence by the lender on security or collateral from the borrower and flexibility built into repayment programmes has made the noninstitutional sources very popular among the peasant farmers. Noninstitutional sources however, have such limitations as smallness of loan, high interest rates etc.

Notable examples under this source include:

- i. **The "Esusu"**
The "Esusu" is a fund to which a group of individuals sharing common characteristic make a contribution of a fixed amount of money, handed to one person. Each member is able to make use of the money in turn, making allowance for a member in dire need of a loan or advance. These are granted without interest payment.
- ii. **"Ajo"**
In the case of "Ajo", individuals contribute fixed amount of money on a daily basis. The "ajo" collector's duty is to remind contributors of their daily obligation, and safe keep the contributed sum. At the end of each month, the contributors receive their total savings less one day's contribution, the latter being the collector's fee.
- iii. **Money Lenders**
These people usually make their money outside the rural community but later settle down in villages giving loans to farmers at exorbitant interest rates. Some farmers who pledge their lands, crops and buildings have lost them due

to their inability to pay the high interest rates charged on the principal when due.

iv. Friends and Relations

This is part of cultural heritage whereby the prosperous help their less fortunate relatives and friends with loans. In some cases, the loan is not collected back.

v. Personal savings of the farmer

The farmer may use his personal savings to purchase the necessary inputs needed for production. Personal savings is considered as external source as it is assumed that the money lent to the business will be paid back to the farmer in the future. It might be short or long-term depending on the amount invested and the decision of the person using the savings.

b. Institutional Sources

These are sources of capital available to agribusinesses from outside the firm but from institutional sources. These institutional sources are those recognised institutions which follow standardised procedures of lending. They lend at regulated interest but normally require some collateral. The loans from these sources are always large compared with those obtained from non-institutional sources. These sources could be commercial banks, co-operatives, non-government organisations, etc. Loaning of funds to the government of a country by international donor agencies for financing agricultural projects could also be termed as external finance.

i. Commercial banks

A commercial bank is a type of financial intermediary. It raises funds by collecting deposits from business concerns and consumers via checkable deposits, savings deposits and time deposits. It makes loans available to businesses and consumers. Commercial banks are run to make profit and they are therefore concerned with receiving deposits and lending to businesses. They make long term, intermediate and short-term loans, lines of credit and special loans. Examples of commercial banks in Nigeria include: United Bank of Africa (UBA) Plc., First Bank of Nig. Plc., Union Bank of Nig. Plc.

ii. Leasing or renting

This involves business renting equipment, stores, warehouses, offices and other things for years or months. Almost any important fixed asset can be rented or leased. Much of the money used in leasing comes from financial institutions and insurance companies.

Leasing usually costs more than interest paid on a loan and the longer the lease period, the lower the charges. Businesses lease to avoid using resources for purchasing assets. The business may decide to use its funds to expand rather than buying assets that can be rented. Leased assets can be returned to the lesser for newer and better ones.

Leasing, however, has its disadvantages. It usually costs more than borrowing because the business is committed to certain payments which could be avoided if the asset is owned. In many instances, the lessee arranges to buy the asset at the end of the leasing period. The leasing company of Nigeria (LECON) is an example of a leasing company. It is a subsidiary of Bank of Industry (BOI). Some detailed information is provided on BOI in the next unit.

iii. Accounts receivable loans

These are loans in which the bank lists business accounts receivable as collateral. This can be done in two ways namely: notification or non-notification.

Notification implies that the bank is informing the debtor that it wishes to collect part of the money that it owed. The bank receives the payment and deducts a service charge and interest then credits the balance against the borrower's loan.

Non-notification means that the borrower collects the receivables and forwards them to the bank. A disadvantage of non-notification is that record keeping and costs of interests are high, also there is no managerial flexibility.

iv. Warehouse receipts

This is a means of using inventory as security for loans. This type of loan is possible only on non-perishable items and allows the borrower to get along with limited working capital. The borrower sells the inventory to the bank, and then buys back the receipts from the bank. Banks also grant personal unsecured loans to owners based on good reputation or financial status of the borrower. This is a risk to the lender because he may not get repaid in case the borrower defaults. Banks also grant secured loans such as mortgages on real property, equipment and loans against the borrower's life insurance policies, stocks, bonds, etc.

A financial institution may offer to help sell products by buying sales instalment contracts from the seller. It is a contract made by the buyers to pay for the product in a manner agreed upon by the seller.

v. Trade credit

This is the practice of buying goods and services now and paying for them later. Suppliers of inputs and vendors of agribusinesses

may advance credit to the farmer in form of supplies/inputs. Most suppliers will normally agree to supply on credit if the business is creditworthy. The farm manager may negotiate for longer credit terms with the input supplier. Thus, the supplier becomes a source of the business but at no cost to the business. It is good practice to pay suppliers quickly as this will help develop a good relationship between the business and the supplier.

vi. Insurance companies

Like other financial institutions, insurance companies look for businesses to invest funds they have collected from policy holders. Most insurance companies prefer intermediate and long-term loans on fixed assets such as real estate, equipment and mortgages for collateral. If the farmer has a policy with the insurance company, that company will usually grant the farmer loan amounts that are the cash value of the policy and at very attractive interest rates. Examples of insurance companies include the Nigerian Agricultural Insurance Corporation (NAIC), Industrial and General Insurance Company Ltd. (IGI), Leadway Assurance, etc.

vii. Cooperative banks

A cooperative bank is a cooperative society carrying on the business of banking. It offers greater access to its members to savings and borrowing facilities and at relatively cheaper costs than traditional commercial banks. Cooperative banks are owned by their cooperative patrons such as weavers, crop farmers, carpenters, etc.

Unlike commercial banks which are profit oriented, cooperative banks are service oriented, they aim at profit making too, but not at the expense of their members. Cooperative banks operate on a smaller scale than commercial banks and are usually located in rural areas. The relationship between cooperative banks and other customers goes beyond a contractual relationship. They add a personal touch to their relationship with customers. The staff members of cooperative banks are usually rural people themselves; hence they do not face the many problems staff of commercial banks face such as accommodation and communication problems.

viii. Promissory notes

This is a promise by the borrower to pay to the lender a particular amount of money with an interest after a specified period of time. Promissory notes can be negotiated i.e., the holder can sell the note and the new owner will have the same claim against the borrower as the original lender. Promissory notes can be sold by the borrower to a bank at a discount if the borrower needs quick

cash. Promissory notes are common with agribusinesses, banks, private individuals and creditors.

ix. Community banks

These are self-sustaining financial institutions which are owned and managed by a community or group of communities for the purpose of providing credit, receiving deposits and rendering banking and other financial services to their members largely on a basis of self-recognition and credit worthiness. Community banks in Nigeria were established to mobilise rural savings, promote rural development and stimulate productive activities through the establishment of micro-enterprises, enhancing rural incomes and alleviating poverty in rural areas.

x. Bonds

A bond may be secured or unsecured. A secured bond is issued with collateral such as real estate, equipment or pledged assets. An unsecured bond (called a debenture bond) is a bond backed only by the reputation of the issuer.

Self-Assessment Exercises

1. How do cooperative banks contribute to agricultural funding in Nigeria?
2. Differentiate between promissory notes and bonds.

3.5 Summary

In this unit, you have learnt about:

- five internal sources of finance that
 - ✓ farmers sometimes retained some of their earnings
 - ✓ sell some of their assets when the needs arise
 - ✓ sometimes they can reduce their stocks
 - ✓ invest more of owners' money or through taking into the business additional people who are willing to invest their funds in it. The earnings are not distributed but re-invested as **equity capital**
 - ✓ they sometimes sell shares of stock to people who are known to the present owners such as employees and people in the community who are interested in investing funds in promising businesses. Such sold stocks are referred to as **common stock**.
- five non-institutional external sources of finance which include:
 - ✓ "Esusu"
 - ✓ "Ajo"
 - ✓ Money lenders
 - ✓ Friends and relatives

- ✓ Personal savings of the farmer.
- Ten institutional external sources which include:
 - ✓ Commercial banks
 - ✓ Leasing or renting
 - ✓ Accounts receivable on loans
 - ✓ Warehouse receipts
 - ✓ Trade Credits
 - ✓ Insurance companies
 - ✓ Cooperative Banks
 - ✓ Promissory Notes
 - ✓ Community Banks and
 - ✓ Bonds.

3.6 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

3.7 Possible Answers to Self-Assessment Exercise(s)

1. A cooperative bank is a cooperative society carrying on the business of banking. It offers greater access to its members to savings and borrowing facilities and at relatively cheaper costs than traditional commercial banks. Cooperative banks are owned by their cooperative patrons such as weavers, crop farmers, carpenters, etc.

Unlike commercial banks which are profit oriented, cooperative banks are service oriented, they aim at profit making too, but not at the expense of their members. Cooperative banks operate on a smaller scale than commercial banks and are usually located in rural areas. The relationship between cooperative banks and other customers goes beyond a contractual relationship. They add a personal touch to their relationship with customers. The staff members of cooperative banks are usually rural people themselves; hence they do not face the many problems staff of commercial banks face such as accommodation and communication problems.

2. **Promissory notes:**

A promissory note is a promise by the borrower to pay to the lender a particular amount of money with an interest after a specified period of time. Promissory notes can be negotiated i.e., the holder can sell the note and the new owner will have the same claim against the borrower as the original lender. Promissory notes can be sold by the borrower to a bank at a discount if the borrower needs quick cash. Promissory notes are common with agribusinesses, banks, private individuals and creditors.

Bonds:

A bond may be secured or unsecured. A secured bond is issued with collateral such as real estate, equipment or pledged assets. An unsecured bond (called a debenture bond) is a bond backed only by the reputation of the issuer.

Unit 4 Agricultural Credit Banks

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 The Role of Agricultural Credit Banks
 - 4.3.1 The Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB)
 - 4.3.2 Commercial Banks
 - 4.3.3 Cooperative Banks
 - 4.3.4 Cooperative Societies
 - 4.3.5 Credit Unions
 - 4.3.6 Community Banks
 - 4.3.7 Non-governmental Organisations (NGOs)
 - 4.3.8 Bank of Industry (BOI)
 - 4.3.9 The World Bank
 - 4.3.10 The African Rural and Agricultural Credit Association (AFRACA)
- 4.4 Summary
- 4.5 References/Further Readings/Web Resources
- 4.6 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

In the previous unit, you learnt that sources of credit may be institutional or non-institutional. Banks generally fall in the category of external institutional source of credit for farmers. The Nigerian government had established various banking institutions to cater for agricultural lending. This unit gives further details on these institutions.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- describe at least five agricultural credit banks
- explain the roles of different agricultural credit banks.

4.3 The Role of Agricultural Credit Banks

Simply put, the role of a bank is to mediate between those who have surplus funds and lend to those who require loans. It was recognised that for a developing economy like Nigeria, lending to agriculture is different from commercial banking.

4.3.1 The Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB)

The Nigerian Agricultural Bank Ltd. (NAB) was established in 1973 by the Federal Military Government as a Federal Agricultural Bank. Its main objectives were rapid transformation, expansion and modernisation of agriculture. The government recognising the important roles cooperatives have to play in the development of agriculture renamed the bank Nigerian Agricultural and Cooperative Bank Limited (NACB).

The wide scope of operation of commercial banks and their profit objectives put the agricultural sector at a disadvantage in competition for funds with other sectors of the economy. The NACB was established to redress this situation. In 2000, NACB was therefore incorporated to Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB).

Other bodies specialising in agricultural credit

These are bodies or institutions other than agricultural credit bank which provide credit to agriculture. They include:

4.3.2 Commercial Banks

Like it has been stated previously, commercial banks are financial intermediaries who receive deposits and lend to businesses, including agriculture. While banks are the principal sources of capital, they are not always the most important source of credit to agriculture than the informal sector.

4.3.3 Cooperative Banks

The first rural cooperative credit institutions were founded in Germany in the late 19th Century. These cooperatives later formed village and regional banks. Rural cooperative banks are well suited to supply credit to agriculture especially small farmers because:

- (a) they are service oriented and not profit oriented, hence they can offer cheap credit to farmers
- (b) their projects are agriculture based, the opportunity cost of agricultural credit is zero
- (c) administrative charges are minimal because branches are rural based and staff do not need additional training
- (d) they are rural based and therefore have knowledge of the borrower's business and credit worthiness. This will reduce diversion of funds because the bank can monitor the borrower's farming activities

- (e) the borrower is not hindered by procedure because they are readily explained by staff
- (f) with proper management, cooperative banks can generate their own funds and would not need a helping hand from state governments.

In spite of the suitability of cooperative banks in supplying credit to farmers, cooperative banks in Nigeria are not suitable for financing agriculture in general and the small farmer in particular. They have been operating in the same manner as commercial banks. They are unable to generate capital internally and lack adequate financial support from government. If the small farmer is to be provided with proper banking facilities, the financial system must be altered to accommodate cooperative banks in their real sense.

4.3.4 Cooperative Societies

The International Cooperative Alliance (ICA) defined cooperatives as an autonomous association of persons united voluntarily to meet their common economic, social, cultural needs and aspirations through jointly owned and democratically owned enterprise.

Cooperative credit organisations are created to make credit facilities available to members at reasonable costs. The principles guiding cooperatives are as follows:

- (a) voluntary and open membership - without any form of discrimination, and
- (b) members should be willing to accept terms of membership.
- (c) democracy.
- (d) economic participation - Members contribute equally to and democratically control the capital of their cooperative. Surpluses are allocated to several uses such as developing the organisation, setting up reserves, benefiting members according to their transactions with the cooperative.
- (e) constant education and training of members.
- (f) cooperation among cooperatives. They serve their members most effectively and strengthen the cooperative movement by working together through local, national and international structures such as cooperative unions.
- (g) sustainable development of their communities
- (h) autonomy and independence.

4.3.5 Credit Unions

A credit union is a cooperative financial institution owned and controlled by its members. Credit unions are different from banks and other financial institutions in that the members who have accounts in the credit unions are the owners of the credit unions. Policies governing interest rates and other matters are set by a volunteer board of directors elected by the members. Only members may deposit or borrow money from it. Credit unions pay higher dividend rates on shares/deposits and charge lower interest rates on loans than banks. The revenue of credit unions must exceed operating expenses and dividends in order to maintain capital and solvency.

4.3.6 Community Banks

The number of community banks in the country has been fluctuating in recent years due to reforms in the financial sector and the need to ensure that only sound and adequately capitalised banks continue to operate. The number rose from 66 in 1991 to 11,368 in 1995 and then dropped to 747 in 2001 before increasing again to 753 at the end of 2004. The average deposit liabilities of community banks increased steadily from ₦1.2 million in 1991 to ₦6.8 million in 1998 and to ₦34 million in 2004. The average loans and advances of the banks rose from ₦0.27 million in 1991 to ₦3.47 million in 1998 and to ₦18.44 million in 2004.

4.3.7 Non-governmental Organisations (NGOs)

NGOs are private organisations that pursue activities to relieve suffering, promote interests of the poor, protect the environment, provide basic services or undertake community development. The activities of NGOs cover such areas as health, education, human rights, environment, agriculture, etc. NGOs may provide credit to farmers in cash or kind and may give training advice to farmers on the best methods to improve agricultural production and to manage their finances.

4.3.8 Bank of Industry (BOI)

The BOI is owned by the Federal Government of Nigeria. The bank emerged from the government's rationalisation of some Development Finance Institutions (DFIs) namely the Nigerian Bank for Commerce and Industry (NBCI), Nigerian Industrial Development Bank (NIDB) and the Nigerian Economic Reconstruction Fund (NERFUND). The bank has four subsidiaries from its merger with NIDB:

- Leasing Company of Nigeria (LECON)

- NIDB Trustees Limited (NTL)
- NIDB Consultancy and Finance Limited (NIDB Consult)
- Industrial and Development Insurance Brokers (IDIB).

The bank has an initial capital base of ₦50 billion. It engages in projects in areas where Nigeria has comparative advantage; in projects that engage efficient conversion of local raw materials into finished goods; in ventures that are cost effective, and quality products that can be marketed at home and abroad.

The bank offers the following services; medium and long-term loans, equity financing, working capital finance, management of dedicated funds, loan guarantees, co-financing, investments in corporate boards, lease financing, trusteeship, stock brokerage, foreign exchange dealership and insurance brokerage.

4.3.9 The World Bank

The World Bank specialises in agricultural credit through assisted programmes such as Agricultural Development Projects (ADP), Fadama I, Fadama II and currently Fadama III projects.

4.3.10 The African Rural and Agricultural Credit Association (AFRACA)

AFRACA is an association of banks and financial institutions which are directly involved in providing financial services for rural development. Its membership is open to all central banks, commercial banks, government institutions and other institutions involved in rural development. AFRACA was established in 1971 and has a liaison status with the Food and Agricultural Organisation (FAO) of the United Nations.

Self-Assessment Exercises

1. What is the role of the World Bank in financing agriculture in Nigeria?
2. Mention four subsidiaries of BOI from its merger with NIDB.

4.4 Summary

In this unit, you have learnt about the Agricultural Credit Banks like the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB), Commercial Banks, Cooperative Banks, Cooperative Societies, Credit Unions, Community Banks, NGOs, the Bank of Industry, the World Bank which has been supporting the Fadama I, II, and III Projects with loans and African Rural and Agricultural Credit Association (AFRACA) which is an association of banks and financial institutions directly involved in providing financial services for rural development.

4.5 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

4.6 Possible Answers to Self-Assessment Exercise(s)

1. The World Bank specialises in agricultural credit through assisted programmes such as Agricultural Development Projects (ADP), Fadama I, Fadama II and currently Fadama III projects.
2. **Four subsidiaries of BOI from its merger with NIDB.**
 - a. Leasing Company of Nigeria (LECON)
 - b. NIDB Trustees Limited (NTL)
 - c. NIDB Consultancy and Finance Limited (NIDB Consult)
 - d. Industrial and Development Insurance Brokers (IDIB).

MODULE 4 ECONOMIC FINANCIAL TOOLS

- Unit 1 Concept of Interest Rates
- Unit 2 Analysis of Interest Rates on Loans
- Unit 3 Three R's and Five C's of Credit
- Unit 4 Seven P's of Credit

Unit 1 Concept of Interest Rates

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Interest Rate
 - 1.3.1 Why Charge Interest?
 - 1.3.2 Factors that affect Interest Rates
 - 1.3.2.1 Risk of Default
 - 1.3.2.2 Length of Loan
 - 1.3.2.3 Size of Loan
 - 1.3.2.4 Competition among Lenders
 - 1.3.3 Calculations of Interest Rates
 - 1.3.4 Gray Areas in Calculating Interest Rate
- 1.4 Summary
- 1.5 References/Further Readings/Web Resources
- 1.6 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

You will recall in module 3 unit 1 that one of the methods of acquiring capital is by borrowing. You learnt that borrowing involves obtaining a certain amount of funds to be repaid at a specified future period. One of the problems involved in using credit is determining whether or not it will pay to borrow. When one borrows, he will not only repay the total sum called principal but also some additional charge(s) for the use of the funds. The borrower will be at a disadvantage unless, by using the credit, net income is increased at least enough to cover the interest on the loan.

It is necessary for the borrower to know in advance what the extra charge is before taking the possession of the borrowed funds. This unit therefore deals with the concept of Interest Rate and how it is calculated.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define interest rate
- explain why interest is charged
- enumerate factors affecting interest rate
- calculate interest rate.

1.3 Interest Rate

Interest is the price paid for the use of money. It is always expressed as a percentage. That means, an annual interest of 20% means that the borrower must pay an amount that equals to 0.2 of the fund he has borrowed if he has used the money for one year. Fundamentally, interest equates the future with the present. That is, a 20% interest rate on ₦1,000.00 to be paid in a year's time will equal ₦200.00 at the end of that year.

Interest can be looked upon from two points of view, namely: the credit institution, that is banks and the borrower e.g. the farmer. The bank is the lender while the farmer is the borrower. From the lenders point of view, interest is the amount he charges the borrower for the use of his money. From the borrower's point of view, interest is the amount of money he pays the bank for the use of the money he borrows.

1.3.1 Why Charge Interest?

Lenders charge interest because of the alternative opportunities available for the use of the funds. The lender must be rewarded because he loses control over his funds for the length of the loan agreement and because he faces the risk of loss of part or the entire loanable fund if the borrower defaults in repayment as agreed. Lenders also take into account the possible loss in the purchasing power of the money he has loaned which may emanate from inflation and other macroeconomic indicators.

In a free financial market, established price paid for the use of money performs much the same basic rationing allocating functions as other processes in other markets. Interest rates are comparatively high when loanable funds are scarce relative to demand in a competitive market. These high rates, due to scarcity of loanable funds will deter some farmers and businessmen from borrowing and the funds that are available will be allocated to those producers who can pay the higher rates because of the more remunerative purposes for which they will use

the borrowed funds. These high interest rates are said to check against the diversion of production loan to consumption purposes.

On the lenders side who supply these funds, high interest rate will provide an income incentive which, along with other motives should encourage them to increase over time the amount of capital available for lending to both producers and consumers. Unfortunately, governments in most developing countries frequently have established interest rates well below the equilibrium level. This makes the limited amount of available funds not being directed to the most profitable uses, and savers not given the incentive of higher returns to increase their supply of savings.

1.3.2 Factors that Affect Interest Rates

Interest rates vary over time depending on the demand for and the supply of loanable funds, and the degree to which governments regulate financial markets. Government does this through their efforts to stabilise the economy by monetary and fiscal policies and CBN interventions. When these policies become restrictive, borrowing becomes more costly; and when they become more expansive, interest rates fall and borrowing increases.

Levels of interest rates are usually very important factors in making decisions about long-term loans rather than short termed loans. For example, an interest rate of 8 or 16% should not be instrumental in borrowing money for 8 months for the farm but would take on a far more weight in considering a 10 – 15-year loan to buy a tractor. Hence, a historical perspective on interest rates becomes very necessary to borrowers making long-term commitments. Long-term borrowers of historically high rates of interest should explore the possibilities of including some provisions in the loan agreement to permit refinancing, should future rates fall substantially.

Irrespective of whether interest rates in general are relatively low or high, there will be a wide range in the rates being charged on different loans at any given time, especially by informal lenders. Those charged by the formal institutions are often circumscribed by government regulations.

Factors that lenders consider in setting interest rates on agreements include:

1.3.2.1 Risk of Default

Lenders charge high interest rates to cover the risk of default especially if a borrower is a small farmer with low income and lack assets to offer

as security. On the other hand, big farmers with relatively low risk of default and low debt frequency can borrow at lower rates. This is why government borrows at lower rates than individuals, except in cases where the economic and political stability of such a government is questionable.

1.3.2.2 Length of Loan

The flexibility and liquidity involved in long-term loans due to some prospect of increased inflation or unstable economic conditions in the future make long-term lenders charge higher rates to compensate for this uncertainty, or reduce the length of their loans. High inflation combined with low fixed interest rate, as is frequently the case in developing countries, makes loan funds to be drawn from agriculture into other sectors to the detriment of small farmers who are involved in the business of agricultural production.

Though the loans may be repaid in full, long-term lenders frequently suffer serious erosion of capital through inflation because the principal when repaid could purchase far less in goods and services than when the money was loaned 10-15 years earlier. A loan agreed at an interest rate of 10% and repaid after a period of time when inflation rate has gone 12% will yield a negative interest rate of 2%. In some developed countries, loans are indexed (real interest rates), that is, their terms provide for adjustments to compensate for the change in the value of money.

1.3.2.3 Size of Loan

The administrative cost of making, processing and collecting a loan is mostly built into the interest rate. For a small loan, these administrative costs will be comparatively large and will add significantly to the interest rate that must be charged. Thus, it will be far cheaper per naira loaned to make one loan for ₦50,000.00 than to make a hundred for ₦500.00. This is because the administrative cost of making ₦500.00 loan may be the same as that of making ₦50,000.00 loan. The administrative cost of making 100 (number) of ₦500.00 loans will be far higher than that of making ₦50,000.00 single loan. Therefore, the interest rate on small loans should be higher.

Self-Assessment Exercises

1. Why do lenders charge interest?
2. In order to calculate the annual rate of interest being charged on a loan, it is necessary to know....?

1.3.2.4 Competition among Lenders

Interest rates may vary at any time within an economy even on loans of similar size, length and quality, depending on competitive conditions. If there is only one man giving loan to farmers in a village, his interest rate will be higher than if there are 100 men ready to give out loans.

1.3.3 Calculations of Interest Rates

In order to calculate the annual rate of interest being charged on a loan, it is necessary to know:

- (1) the total charges made on the loan, including the amount for inspection fees and service charges,
- (2) the amount of money available to the borrower after reducing any interest and other fees collected in advance, and
- (3) the length of loan expressed as a fraction of one year.

Simple interest can be calculated using the formula:

$$\text{Interest } (i) = \frac{P \times T \times R}{100}$$

Where:

P = Principal

I = Interest

T = Time

R = Rate

For example,

- (1) If a farmer obtained a loan of ₦10,000.00 for 1 year at the interest of 20%

$$\text{Int.} = \frac{P \times T \times R}{100}$$

$$\text{Int.} = \frac{10,000 \times 1 \times 20}{100}$$

$$\text{Int.} = \text{₦}2,000.00$$

- (2) If the farmer borrows the money for only six months, the interest will be

$$\text{Int.} = \frac{P \times T \times R}{100}$$

$$\text{Int.} = \frac{10,000 \times \frac{1}{2} \times 20}{100}$$

$$\text{Int.} = \text{₦}1,000.00$$

With the formula above one can calculate interest, principal, time or rate by simple substitution.

1.3.4 Grey Areas in Calculating Interest Rate

For example, if a lender gives out ₦10,000.00 for 1 year at 20% interest rate, the interest will be ₦2,000.00. Suppose, however, he decides to collect the interest of ₦2,000.00 in advance, at what rate of interest did he give out the loan?

1st step: Subtracting ₦2,000.00 from ₦10,000.00 gives ₦8,000.00

∴ Principal = ₦8,000.00

Interest = ₦2,000.00

Time = 1 year

$$\therefore \text{Rate} = \frac{\text{Int.} \times 100}{\text{Prin.} \times \text{Time}} \%$$

$$\text{Rate} = \frac{\text{₦}2,000 \times 100}{\text{₦}8,000 \times 1}$$

$$\text{Rate} = 25\%$$

A farmer borrows ₦10,000.00 from a bank for 4 months and decides to pay back ₦2,500.00 by instalment every month. Calculate how much the farmer will pay as interest at the end of the 4th month and the rate of interest at the end of the 4th month. The rate of interest was 20%

$$\text{1st month Interest} = \frac{P \times T \times R}{100}$$

$$= \frac{\text{₦}10,000 \times 1 \times 20}{100 \times 12 \times 1}$$

$$= \text{₦}166.67$$

Subtracting ₦2,500.00 which he paid back at the end of the first month, makes the principal balance as (₦10,000.00 – ₦2,500.00) = ₦7,500.00

$$\text{2nd month Interest} = \frac{P \times T \times R}{100}$$

$$= \frac{\text{₦}7,500 \times 1 \times 20}{100 \times 12 \times 1}$$

$$= \text{₦}125.00$$

By subtracting ₦2,500.00 from ₦7,500.00 gives the principal balance as (₦7,500.00 – ₦2,500.00) = ₦5,000.00

$$\begin{aligned} \text{3rd month Interest} &= \frac{P \times T \times R}{100} \\ &= \frac{\text{N}5,000 \times 1 \times 20}{100 \times 12 \times 1} \end{aligned}$$

$$= \text{N}83.33$$

By subtracting $\text{N}2,500.00$ from $\text{N}5,000.00$ gives the principal balance as $(\text{N}5,000.00 - \text{N}2,500.00) = \text{N}2,500.00$

$$\begin{aligned} \text{4th month Interest} &= \frac{P \times T \times R}{100} \\ &= \frac{\text{N}2,500 \times 1 \times 20}{100 \times 12 \times 1} \end{aligned}$$

$$= \text{N}41.67$$

∴ Total interest for the 4 months

$$\text{1st month} = \text{N}166.67$$

$$\text{2nd month} = \text{N}125.00$$

$$\text{3rd month} = \text{N}83.33$$

$$\text{4th month} = \text{N}41.67$$

$$\text{Total} = \text{N}416.67$$

Short Method

This interest can be calculated using a shorter method thus:

1st month the farmer used $\text{N}10,000$

2nd month the farmer used $\text{N}7,500$

3rd month the farmer used $\text{N}5,000$

4th month the farmer used $\text{N}2,500$

Total amount borrowed = $\text{N}25,000$

Average amount of money used = $\text{N}6,250.00$

∴ Principal for 4 months = $\text{N}6,250.00$

Time = 4 months

Rate = 20%

$$\text{Interest} = \frac{P \times T \times R}{100}$$

$$\begin{aligned} \text{Interest} &= \frac{\text{N}6,250 \times 4 \times 20}{100 \times 12 \times 1} \\ &= \frac{1250}{3} \end{aligned}$$

$$= \text{N}416.67$$

1.4 Summary

This unit looked at the definition of interest rate, why interest is charged on loans, factors that affect interest rates and how interest rates are calculated.

Further in this unit, you have learnt that interest is the price paid for the use of money. It is always expressed as a percentage. Interest is considered upon from two points of view, namely, the credit institution, that is banks and the borrower e.g. the farmer. The bank is the lender while the farmer is the borrower. From the lenders point of view, interest is the amount he charges the borrower for the use of his money. From the borrower's point of view, interest is the amount of money he pays the bank for the use of the money he borrows.

Lenders charge interest because of the alternative opportunities available for the use of the funds. The lender must be rewarded because he loses control over his funds for the length of the loan agreement and because he faces the risk of loss of part or the entire loanable fund if the borrower defaults in repayment as agreed. Lenders also take into account the possible loss in purchasing power of the money he has loaned which may emanate from inflation and other macroeconomic indicators.

Factors that lenders consider in setting interest rates on agreements include:

- Risk of default
- Length of loan
- Size of loan
- Competition among lenders.

The formula for calculating interest is:

$$\text{Interest} = \frac{P \times T \times R}{100}$$

1.5 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press, Ames.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

1.6 Possible Answers to Self-Assessment Exercise(s)

1. Lenders charge interest because of the alternative opportunities available for the use of the funds. The lender must be rewarded because he loses control over his funds for the length of the loan agreement and because he faces the risk of loss of part or the entire loanable fund if the borrower defaults in repayment as agreed. Lenders also take into account the possible loss in purchasing power of the money he has loaned which may emanate from inflation and other macroeconomic indicators.
2. **In order to calculate the annual rate of interest being charged on a loan, it is necessary to know:**
 - a. the total charges made on the loan, including the amount for inspection fees and service charges,
 - b. the amount of money actually available to the borrower after reducing any interest and other fees collected in advance, and
 - c. the length of loan expressed as a fraction of one year.

Unit 2 Analysis of Interest Rates on Loans

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Functions of Commercial Banks
- 2.4 Conceptual Framework
- 2.5 Principles of Lending
- 2.6 Data from Six Commercial Banks in Nigeria
- 2.7 Summary
- 2.8 References/Further Readings/Web Resources
- 2.9 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

In the previous unit, you learnt about concept of interest rate - what it is, why interest is charged on loans, factors that affect the rate of interest and how it is calculated.

Further knowledge is required about the analysis of interest rate as presented in this unit.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- discuss the functions of commercial banks
- explain conceptual framework of commercial banks
- describe the principles of lending
- state six Nigerian commercial banks.

2.3 Functions of Commercial Banks

Commercial banks are profit maximising enterprises and are among financial intermediaries whose main function is to channel funds (intermediation) from savers (surplus spending units - SSUs) to borrowers (deficit spending units- DSUs). This function is made possible through repackaging the flow of deposits, premiums, contributions, and other forms of savings into reasonable amount for large business borrowers. For the purpose of achieving the aim of their business operations and to keep motivating both DSUs and SSUs to continuously participate in this transaction, interest is given to SSUs and charged on DSUs. The difference between the charged interest and the given interest amounts to gross profit to the commercial banks. The basic principle of this financial intermediation by commercial banks is

to offer relatively low interest to savers and charge relatively high interest to borrowers.

However, the two main services commercial banks offer to the agricultural (farm) sector are deposit mobilisation and lending. They are mandated by government to grant credit to agriculture through a variety of instruments including monetary policy instruments, credit guidelines, etc. Although the banks are mandated to grant credit, it is to the discretion of individual banks to determine who qualifies for credit based on established guidelines.

2.4 Conceptual Framework

1. Savings Facilities of Commercial Banks

Commercial bank offers the following savings facilities to farmers and business enterprises in Nigeria:

- a. **Savings Account Deposit:** - This is the most common form of savings, usually with interest payable to the depositors. The commercial bank usually requires a minimum amount of deposit.
- b. **Current Account Deposit:** - This form of savings does not attract interest payment to depositors rather are being charged by the commercial banks. Hence, the account owners can withdraw their funds on demand and with the use of cheques.
- c. **Time Fixed Deposit:** - This form of savings usually has fixed time of maturity before withdrawal can be made and attract higher interest payment than the savings account deposits.

2. Lending Facilities of Commercial Banks

Business enterprises, farmers, farm managers, farm co-operatives, among others have access to the following forms of lending facilities offered by commercial banks in Nigeria:

- a. **Overdraft:** An overdraft is essentially an agreement between the bank and the customer enabling the later to “overdraw” his/her account up to a specified maximum with specified repayment period and interest is calculated on daily basis on the amount by which the account is overdrawn. If the borrower (customer) provides security, it is called “secured overdraft”, otherwise it is termed as “clean overdraft”. This facility enables farm managers and farmers in general to meet emergencies/expenditures that were not initially planned for.
- b. **Loans:** A loan is an agreement by which a customer is offered financial assistance of a fixed sum for a specified period of time. The amount of loan along with the interest is payable in lump sum or instalmentally at the fixed future date depending on the agreement. Unlike the overdraft, a loan requires a separate account known as loan account opened by the bank for the

customer. The value of the loan account is afterwards credited into the current account of the borrower. Generally, loans may be short-term, medium-term or long-term, but commercial banks usually give short-term loans payable on demand.

- c. **Discounting of Bills:** The commercial banks also purchase and discount bills of exchange as part of lending function. Discounting facilities are suitable for a customer, who having given an implicit credit under a bill of exchange, become unable or unwilling to wait for the bill to mature. Discounting bills of exchange is an arrangement between the banker and the customer, under which the former pays the latter immediately the value of a bill payable less an agreed discount, pending the maturity of the bill. When bills of exchange are accompanied by documents of title to goods they are called “documentary bill of exchange”. If a bill is payable on demand, it is called “demand bill”. Discounting of a bill, like other loans, is done after taking securities. It is not a popular form of lending in Nigeria.
- d. **Equipment Leasing:** Equipment leasing is appropriate where it is financially advantageous to lease equipment rather than purchase it outright. The reason for leasing rather than buying might be unavailability of cash or availability of tax advantage to the lease. The point being made is that a farm manager may decide lease equipment (e.g. tractor or harvester) from a commercial bank or its agents if the capital outlay for the purchase of equipment, including value-added tax, is high and likely to eat deep into the finances of farm business.
- e. **Letter of Credit:** A letter of credit represents a letter by a banker introducing a customer to its correspondent bank (or agent) abroad and authorising him to cash on demand. For instance, cheque drawn by the customer, that is, a farm manager with a letter of credit issued by a Union Bank, Samaru can cash his cheque at the Union Bank, London if the letter of credit is addressed to the latter. Letter of credit is appropriate when goods and services are being imported and there is need to use a bank as an arbiter that would ensure that both the importer and the exporter fulfill their obligations under the transactions. It is also appropriate where it is either undesirable or impossible to pay for the import in advance.

2.5 Principles of Lending

Commercial bank considers five (5) basic principles in processing loan applications which are as follows:

- a. Safety**
Credit granted by commercial banks to the borrowers come from money deposited by firms and individuals as well as money borrowed by the commercial banks from other banks and the CBN. In making a loan, the banker therefore ensures that the depositors' money is advanced to the trustworthy and credit worthy parties where the risk of loss is at minimum. The banker relies on the 5C's of credit: character, capacity, collateral, capital and condition. These are treated in detail in the next unit.
- b. Liquidity**
This means the possibility of recovering the loans at short notice in the event of an emergency. The banker must ensure that the money it is advancing is not blocked for a long time and the borrower is in position to repay the advances in time or on short notice, if required earlier. This then brings the question, "what are the borrower's assets to liquidity ratio?"
- c. Dispersal**
As an agricultural credit officer of a bank, this principle requires that you grant loans to qualified people from all sectors of agriculture or from as many sectors as possible, based on the credit guidelines of the CBN. The principle ensures that a large number of customers benefit from available funds. Dispersal reduces risks of recovery, guarantees safety and security of funds.
- d. Remuneration**
This principle is concerned with the profitability of the loan. How much interest (returns) will it guarantee? Will the interest cover the cost of loan administration and also leave the bank with reasonable profit to pay salaries and fringe benefits of staff, dividends to shareholders, etc.? Thus, apart from meeting the conditions, a banker will normally prefer a borrower who is willing to offer a higher rate of interest.
- d. Suitability**
This principle demands that the banker should ensure that the loan is in conformity with the current national credit policy laid down by the CBN or government. Having satisfied that condition, the credit officer should answer the question; to what extent would the loan solve the financial problems of the borrower? Generally, if the loan is insufficient, then there is a high risk of loan repayment failure.

Self-Assessment Exercises

- | |
|--|
| <ol style="list-style-type: none"> 1. What is overdraft? 2. Explain the principles of lending. |
|--|

2.6 Data from Six Commercial Banks in Nigeria

Primary data were obtained and analysed from six sampled commercial banks in Nigeria. The banks are Bank PHB, Oceanic Bank, First Bank, Skye Bank, Zenith Bank and First City Monument Bank. The information obtained is given in Table 2.1.

Table 2.1: Interest Rates of Six Sampled Commercial Banks in Nigeria

Banks	Lending (% p.a.)	Savings (% p.a.)	Fixed Deposit (% p.a.)	Overdraft (% p.a.)
Bank PHB	22	3	9	22
FCMB	22	3	10	22
First Bank	22	4	8	22
Oceanic Bank	21	3	9	21
Skye Bank	22	3	10	22
Zenith Bank	24	4	10	24
Average	22.17	3.33	9.33	22.17

Source: Field Survey, 2009.

Note: The average lending interest rate is approximated to 22% p.a.

According to CBN guideline for the fiscal year 2009, the *prime lending rate* was set at 19% p.a. and the commercial banks are allowed to charge $\pm 2\%$. As a result, the official lending rate is expected to range between 17% p.a. (i.e. $19 - 2$) and 21% p.a. (i.e. $19 + 2$). However, only Oceanic Bank Plc operated within the legal limit of the monetary policy guideline while the remaining banks added either 3% or 5% as against 2% allowed by the apex bank. On the average, the lending rate of 22% exceeded the expected official limit by 1% p.a. The commercial banking rule concerning overdraft in Nigeria is that the interest charged on it is the same and identical with the operating lending rate.

Savings deposit rate is derived from subtracting 4% from Monetary Policy Rate (MPR) which is currently 7.5%. This implies that the savings deposit rate to be paid by commercial banks is 3.5% p.a. But only First Bank and Zenith bank paid 4% interest rate p.a. on savings deposit which is 0.5% p.a. above the official rate of 3.5% p.a. The remaining four banks are paying 3% p.a., which is 0.5% less than the official rate. On the average, the interest paid on savings deposit is 0.17% p.a. less than the official rate of 3.5% p.a... Fixed deposit attracts interest rate that ranges between 8 to 10 % p.a. with 9.33% p.a. as the average.

Take the cases of two customers “A” & “B”. Customer “A” obtained a loan of ₦500,000.00 for one year with an average lending rate of 22% p.a. and customer “B” deposited ₦500,000.00 for the same period of

time under the existing savings deposit rate of 3.33% p.a. The two customers carried out the transaction the same day. What is the gross profit of the bank for these two transactions?

For customer “A”

The loan was ₦500,000.00

Rate was 22%

Time was 1 year

$$\text{Interest} = \frac{PTR}{100}$$

Where:

P = principal,

T = Time

R = Rate

$$\begin{aligned} \therefore \text{Interest} &= \frac{N500,000.00 \times 1 \times 22}{100} = \frac{N11,000,000.00}{100} \\ &= N110,000.00 \end{aligned}$$

This implies that customer “A” will pay ₦110,000.00 as interest for borrowing ₦500,000.00 for a period of one year.

For customer “B”

He deposited ₦500,000.00

Rate was 3.3%

Time is 1 year

$$\begin{aligned} \therefore \text{Interest} &= \frac{N500,000.00 \times 1 \times 3.33}{100} = \frac{N1,665,000.00}{100} \\ &= N16,650.00 \end{aligned}$$

This implies that customer “B” will gain ₦16,650.00 as interest for parting with ₦500,000.00 for a period of one year.

We can see that for these two transactions the commercial bank in Nigeria has made ₦93,350.00 as gross profit.

Assume that another customer “C” puts ₦500,000.00 in fixed account for 5 years at an interest rate of 9.33% p.a. and customer “D” deposited the same ₦500,000.00 for the same period of time under the existing saving deposit rate of 3.33% p.a. How much will each of the customers get at the end of 5 years as interest?

For customer “C” using compound interest

$$A = P(1 + i)^n$$

Where:

A = amount

P = principal

i = interest rate

n = number of years

$$A = ₦500,000.00(1 + 0.0933)^5$$

$$= \text{N}500,000.00(1.0933)^5$$

$$= \text{N}500,000.00(1.5621)$$

$$\therefore \text{Amount} = \text{N}781,050.00$$

$$\text{Thus interest} = A - P$$

$$= \text{N}781,050.00 - \text{N}500,000.00$$

$$\therefore \text{Interest} = \text{N}281,050.00$$

This implies that customer "C" will get $\text{N}281,050.00$ as interest for fixing $\text{N}500,000.00$ at the end of 5 years.

For customer "D"

His principal was $\text{N}500,000.00$

Rate was 3.3%

Time was 5 years

$$\therefore \text{Interest} = \frac{\text{N}500,000.00 \times 3.33 \times 5}{100}$$

$$\text{Interest} = 5000 \times 3.33 \times 5 = \text{N}83,250.00$$

This implies that for customer "D" the interest for parting with $\text{N}500,000.00$ for a period of 5 years, is $\text{N}83,250$ only because of the savings deposit rate that was used to calculate his interest.

We assume that customer "E" wishes to take an overdraft of $\text{N}500,000.00$ for 30 days (a month), how much will he pay as interest for the month?

Customer "E" overdraft

$$\text{Interest} = \frac{P \times T \times R}{100}$$

$$\text{Interest} = \frac{\text{N}500,000.00 \times 1 \times 22}{100 \times 12}$$

$$= \frac{11,000,00}{1200}$$

$$\therefore \text{Interest} = \text{N}9,166.67$$

2.7 Summary

In this unit you have learn that the major function of the commercial banks is to channel funds (intermediation) from savers (surplus spending units - SSUs) to borrowers (deficit spending units- DSUs). This function is made possible through repackaging the flow of deposits, premiums, contributions, and other forms of savings into reasonable amount for large business borrowers.

Savings facilities offered by the commercial banks are savings account deposits, current account deposits and time fixed deposits. The lending facilities offered include overdrafts, loans, discounting of bills, equipment leasing and letters of credit.

The five basic principles considered by the commercial banks in processing loan applications which are safety, liquidity, dispersal, remuneration and suitability.

The data from the six Nigerian banks show that the average lending interest rate is approximated to be about 22% p.a., while it is about 9.3% for fixed deposits and only 3.3% for savings.

2.8 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press, Ames.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

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2.9 Possible Answers to Self-Assessment Exercise(s)

1. An overdraft is essentially an agreement between the bank and the customer enabling the later to “overdraw” his/her account up to a specified maximum with specified repayment period and interest is calculated on daily basis on the amount by which the account is overdrawn. If the borrower (customer) provides security, it is called “secured overdraft”, otherwise it is termed as “clean overdraft”. This facility enables farm managers and farmers in general to meet emergencies/expenditures that were not initially planned for.

2. Principles of Lending

Commercial bank considers five (5) basic principles in processing loan applications which are as follows:

a. Safety

Credit granted by commercial banks to the borrowers come from money deposited by firms and individuals as well as money borrowed by the commercial banks from the other banks and the CBN. In making a loan, the banker therefore ensures that the depositors' money is advanced to the trustworthy and credit worthy parties where the risk of loss is at minimum. The banker relies on the 5C's of credit: character, capacity, collateral, capital and condition.

b. Liquidity

This means the possibility of recovering the loans at short notice in the event of an emergency. The banker must ensure that the money it is advancing is not blocked for a long time and the borrower is in position to repay the advances in time or on short notice, if required earlier. This brings the question, “what are the borrower's assets to liquidity ratio?”

c. Dispersal

As an agricultural credit officer of a bank, this principle requires that you grant loans to qualified people from all sectors of agriculture or from as many sectors as possible, based on the credit guidelines of the CBN. The principle ensures that a large number of customers benefit from available funds. Dispersal reduces risks of recovery, guarantees safety and security of funds.

d. Remuneration

This principle is concerned with the profitability of the loan. How much interest (returns) will it guarantee? Will the interest cover the cost of loan administration and also leave the bank with reasonable profit to pay salaries and fringe benefits of staff, dividends to shareholders, etc.? Thus, apart from meeting the conditions, a banker will normally prefer a borrower who is willing to offer a higher rate of interest.

e. Suitability

This principle demands that the banker should ensure that the loan is in conformity with the current national credit policy laid down by the CBN or government. Having satisfied that condition, the credit officer should answer the question; to what extent would the loan solve the financial problems of the borrower? Generally, if the loan is insufficient, then there is a high risk of loan repayment failure.

Unit 3 Three R's and Five C's of Credit

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 The Three R's of Credit
- 3.4 Five C's of Credit
- 3.5 Summary
- 3.6 References/Further Readings/Web Resources
- 3.7 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

When a farmer approaches an institutional agency with a proposal for loan, the banker should be convinced about the economic viability of the proposed investment. In this connection, some guidelines are essential for the banker to ponder over, for, each investment activity is different from the other in terms of productivity. Keeping this in view, various farm credit proposals including the details of repayment plans are furnished in this unit.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain the 3R's of credit
- explain the 5C's of credit.

3.3 The Three R's of Credit

When a proposal for credit reaches the banker's table, three basic financial aspects are assessed by the banker.

- (1) If the loan is advanced, will it generate returns more than the cost?
- (2) Will the returns have surplus, to repay the loan when it falls due?
and
- (3) Will the farmer stand up to risk and uncertainty in farming?

These three aspects are popularly known as Three R's of credit, which are as follows:

- a. Returns from the investment.
- b. Repayment capacity the investment generates.
- c. Risk-bearing ability of the farmer-borrower.

a. Returns from the Investment

This is an important measure in the credit analysis. The banker needs to have an idea about the extent of returns likely to be obtained from the proposed investment. The farmer's demand for credit can be accepted only when he will be able to generate returns that will enable him to tide over the costs. Returns depend upon the decisions like what to grow, how to grow, how much to grow, when to sell, where to sell, etc, which the farmers take in their production activities. The main concern here is that the farmers should be able to generate incremental income when they go for the additional costs to be made good by the borrowed funds. To estimate the additional returns from the borrowed funds, we can apply partial budgeting technique as presented in Table 3.1.

By getting a loan amount of ₦4,500 and ₦4,600 in wet and dry seasons respectively, the farmer can switch over from local varieties of paddy to high yielding improved varieties in both the seasons. The borrowed fund is quite productive in both seasons. The borrowed fund is quite productive in generating an incremental amount of ₦5,700 per hectare of land. It is an important positive factor in favour of the farmer to present his claims for the loan amount from the institutional agency.

b. Repayment Capacity

This simply means the ability of the farmer to clear off the loan obtained for production purposes within the time stipulated by the bank. The loan amount may be productive enough to generate additional income to the borrower, but it may not be productive enough to repay the loan. Hence, the necessary condition here is that the loan should not only be profitable but also have potential for effecting repayment. Then only the farmer has a favourable point on his side. The above condition emerges out of the fact that repayment capacity not only depends upon returns, but also several other factors as given below:

$$Y = \frac{f(X_1, X_2, X_3, X_4)}{\text{Quantitative variable}} \quad \frac{X_5, X_6, X_7}{\text{Qualitative variable}}$$

Where:

Y = Repayment capacity (₦)

X₁(+) = Gross returns from the enterprise for which loan was taken during a season/year (in ₦)

X₂(-) = Working expenses (in ₦)

X₃ (0) = Family consumption expenditure (in ₦)

X₄(-) = Other loans due (₦)

X₅ (+) = Literacy

X₆ (+) = Managerial skill

X₇ (+) = Social status

The signs in parentheses are a priori expected signs based on past studies.

Table 3.1: Partial budgeting technique

Season/Crop	Existing Plan				Season/Crop	Alternative Farm Plan			
	Area (ha)	Gross returns (N)	Costs (N)	Net Income (N)		Area (ha)	Gross returns (N)	Costs (N)	Net Income (N)
Wet season Paddy (local)	1.0	7,000	3,500	3,500	Wet season Paddy (improved)	1.0	11,500	5,200	6,300
Dry season Paddy (local)	1.0	7,400	3,900	3,500	Dry season Paddy (improved)	1.0	12,000	5,600	6,400

For the calculations assume the total farm size is devoted to the production of improved varieties

Ai) Added costs = 5,200 + 5,600 = N10,800 B i) Added returns = 11,500 + 12,000 = N23,500

ii) Reduced returns = 7,000 + 7,400 = N14,400 Reduced costs = 3,500 + 3,900 = N7,400

Total of A = N25,200

Total of B = N30,900

Incremental income = 30,900 – 25,200 = ~~N~~5,700

Though the returns are encouraging, other factors may offset the returns reducing the farmer to a helpless condition with regard to repayment capacity. The estimation of repayment capacity varies from crop loans (self-liquidating loans) to term-loans (non-liquidating loans or partially liquidating loans). In the case of self-liquidating loans, the repayment capacity is as follows:

For simplicity, only quantitative variables are taken into consideration. Repayment capacity = gross income - (working expenses excluding crop loan + family living expenses + other loans due + miscellaneous expenditure + crop loan).

A hypothetical example is presented in Table 13 which is generally practiced by the bankers.

It is evident from the table that the farmer has generated gross income of ~~N~~40,500 with a loan amount of ~~N~~5,000. His repayment capacity will be ~~N~~12,100 after clearing the loan which indicates his creditworthiness.

In respect of partially liquidating loans or non-liquidating loans, the repayment capacity is estimated in the following manner:

Repayment capacity = gross income - (working expenses including short term loans + family living expenses + other loans due + miscellaneous expenditure + annual instalment due for term loan)

Table 3.2: Estimation of Repayment Capacity for Self-liquidating Loans

Particulars	Amount (₦)	
	Without loan	With loan
Gross returns	28,000	40,500
Working expenses excluding crop loan	8,800	8,800
Family living expenses	10,000	10,000
Other loans due	4,000	4,000
Miscellaneous expenditure	600	600
Loan taken	-	5,000
Repayment capacity	4,600	12,100

Another hypothetical example for partially liquidating loans is given in Table 3.3. The particulars in Table 3.3 reveal that the farmer has taken an investment loan of ₦20,000 which is payable in 5 equated annual instalments of ₦5,617 each. In this case also the term loan is productive enough to augment gross income to clear off annual instalment quite comfortably. The repayment capacity stood at ₦10,183 after deducting the annual instalments.

a. Causes for Poor Repayment Capacity

The following are the causes for poor repayment capacity of the farmers:

- (1) Small size of land holdings.
- (2) Low productivity and production.
- (3) Low price and fluctuations of prices for agricultural commodities.
- (4) High family expenditure.
- (5) Using farm credit for unproductive purposes.
- (6) Low farmer's equity.
- (7) Lack of adoption of improved technology.
- (8) Poor management of farm resources.

Table 3.3: Estimation of Repayment Capacity for Partially Liquidating Loans

Particulars	Amount (N)	
	Without loan	With loan
Gross income	38,000	54,000
Working expenses including short team loan	18,600	23,600
Family living expenses	10,000	10,000
Other loans due	4,000	4,000
Miscellaneous expenditure	600	600
Annual installment due for term loan	-	5,617
Repayment capacity	4,800	10,183

b. Measures to Strengthen Repayment Capacity

The following are the measures to be adopted to strengthen the repayment capacity of the farmers:

- (1) Increasing net income by proper organisation and operation of the farm business.
- (2) Adopting promising technologies for increasing production and reducing the farm expenses.
- (3) Removing imbalances in the resource availability.
- (4) Scheduling loan repayment plans according to the flow of income.
- (5) Strengthening net worth of the farm households.
- (6) Diversifying the farm enterprises.
- (7) Adopting risk management strategies like crop insurance/cattle insurance/machinery insurance, hedging to control price variations, etc.

c. Risk Bearing Ability

It is the ability of the farmer to withstand the risks that arise due to financial loss. Risk can be quantified through statistical techniques like Co-efficient of Variation, Standard Deviation, Programming Models, etc.

Probabilities can be estimated and ascribed to the measurement of uncertainty phenomenon. Most authors use the terms risks and uncertainty interchangeably. Some of the types or sources of risk in farming are:

- (1) Production risk.
- (2) Technological risk.
- (3) Risk caused by illiteracy and ignorance.
- (4) Inefficiency through sickness of the farmer (personal risk).
- (5) Institutional risk.
- (6) Weather uncertainty.
- (7) Price uncertainty, etc.

The farmer may satisfy the banker with regard to returns and repayment capacity, yet another factor to be fulfilled is risk bearing ability. This is vital because at times our estimates go awry and the expected output may not be forthcoming because the risks enumerated above may stand in the way. Consequently, our plans turn topsy-turvy. Here what we wish to know is whether the farmer has got shock-absorbing capacity to withstand the onslaught of the unforeseen events or not. How is the risk-bearing ability estimated under such situations? The productivity of any enterprise or investment activity is gauged by its past performance. Similarly, in estimating the risk-bearing ability, we need to find out what has been the variation in the yields or returns from the given enterprise over the past 5 or 10 years. This variation can be computed using coefficient of variation technique (we have confined ourselves to

simple statistical tool here). The gross returns are deflated to the extent of variability of income (CV). For example, if the CV of paddy yields in a given area is 15 percent, the expected gross returns are deflated by 15 percent to arrive at the corrected yield or income. From this income so arrived at, the repayment capacity is estimated. In this exercise if the farmer comes out successfully, his credit worthiness is 100 percent endorsed.

Repayment capacity under risk = deflated gross returns - (working expenses excluding proposed loan + family living expenses + other loans due + miscellaneous expenditure + crop loan).

A hypothetical example pertaining to this can be seen in Table 3.4. Suppose the gross income expected is ₦48,000 and the variability in gross income is 15 percent, then the deflated gross income is ₦40,800 i.e., $[48,000 - (48,000 \times 0.15)]$

After allowing the possible reduction in gross income, the repayment capacity is also increased with the loan amount. It infers that the farmer has the risk bearing ability in using the borrowed funds. His is a very sound case for consideration for extending loan by the banker.

Table 3.4: Estimation of Risk Bearing Ability or Repayment Capacity under Risk

Particulars	Amount (₦)	
	Without loan (₦)	With loan (₦)
Deflated gross returns	28,000	40,800
Working expenses excluding crop loan	8,800	8,800
Family living expenses	10,000	10,000
Other loans due	4,000	4,000
Miscellaneous expenditure	600	600
Loan taken	-	5,000
Repayment capacity under risk	4,600	12,400

a. Measures to Strengthen Risk Bearing Ability

These are: (1) developing owner's equity which is the backbone of risk bearing ability, (2) developing moral character i.e., honesty, integrity, dependability, bearing responsibility, etc., which are also called good credit rating, (3) reducing farm and family expenditure: (4) taking up stable and reliable enterprises, (5) providing ability to borrow in both good and bad periods, particularly during the bad periods, the farmer should get the funds, (6) creating ability to earn money and save money, i.e., an individual farmer may be very good in farming but part of the

earnings should be saved to meet uncertainty, and (7) taking up crop and other insurance, etc.

3.4 Five Cs' of Credit

Next to the 'Three Rs', the other tests that can be applied to study the economic viability of a scheme or investment activity are the "Five Cs", viz.

- (1) Character
- (1) Capacity
- (2) Collateral
- (3) Capital
- (4) Condition

a. Character

The basis for credit transactions is, the trust, the trust that the banker has on his borrowers. No doubt the bank insists upon security for any loan, even then, the element of trust has greater say in the mind of the banker before he takes a decision in considering the proposal of a prospective borrower.

The questions that come to mind are: is the prospective loan seeker honest, trustworthy and responsible? Is he a man of integrity? Does he have the ability and willingness to carry out the investment-income project from the beginning to the end? What does his past records suggest in these directions?

The confidence which the institutional agency keeps is influenced by the moral qualities like honesty, integrity, commitment, hard work, promptness, etc., which the borrower exhibits. In essence, it means the mental as well as moral characters of the borrower. Generally, people with good mental and moral character will have good credit character.

b. Capacity

Within this spectrum, the issues of concern are: does the prospective loan seeker have the ability to return the loan along with the interest as at when due? Does he have the requisite managerial abilities and experience in the trade for which he is seeking the loan?

This is related to the capacity of an individual to clear loans when they fall due. It is synonymous with repayment capacity. It largely depends upon the income obtained in the farm business, i.e., $C = f(Y)$, where: $C =$ Capacity and $Y =$ Income.

c. Collateral

Every prospective loan seeker from the commercial banks is expected to provide security (collateral) which will serve as guarantee to the bank in loan recovery in the event of default by the borrower. This is expected to be worth at least the value of the loan facility applied for while in most cases, the net worth of the collateral should be higher than the net worth of the loan in order to guarantee future depreciation of the asset and inflation in the economy.

d. Capital

Other issues considered by lending bank about the customer include: what is the equity or net worth of the borrower's business? What is the value of the collateral which he has provided as security that could be impounded in the event of failure? Note, a banker may refuse to grant loan if the amount requested is insufficient for successful running of the proposed farm enterprise.

Capital implies availability of money with the farmer-borrower, when character and capacity proved to be inadequate. It represents the net worth of the individual. It is related to repayment capacity and risk bearing ability.

e. Condition

Last but not the least is the condition upon which the customer stated when applying for bank loan. Would the loan applied for be used for productive purposes, consumption purposes, political purposes, or welfare purposes, etc? What is the possibility of the stated conditions to yield income necessary enough to ensure loan repayment at the end of the facility period? To what extent would the stated condition contribute to general wellbeing of the borrower, among others?

There should be perfect understanding between the lender and the borrower in credit transactions. This is in fact a *prima facie* requirement for obtaining credit by the borrower.

Self-Assessment Exercises

1. Explain how character influences borrowing capacity.
2. Describe the measures to strengthen risk bearing ability.

3.5 Summary

In this unit you have learnt about the 3 R's that:

- the banker needs to have an idea about the extent of **returns** likely to be obtained from the proposed investment. The farmer's

- demand for credit can be accepted only when he will be able to generate returns that will enable him to tide over the costs;
- it is a necessary condition that the loan should not only be profitable but also have potential for effecting **repayment**;
 - causes for poor repayment capacity include small size of land holdings, low productivity and production, low prices and fluctuations of prices for agricultural commodities, high family expenditure, using farm credit for unproductive purposes, low farmer's equity, lack of adoption of improved technology and poor management of farm resources;
 - it is necessary to know whether the farmer has got the **risk bearing ability** i.e. the shock-absorbing capacity to withstand the onslaught of the unforeseen events or not.

The five C's consists of the lender's consideration of the **character** of the borrower which has to do with the qualities of the borrower in terms of integrity, honesty etc. The **capacity** of the borrower has to do with his ability to return the principal plus the interest. Every lender request for some of **collateral** to serve as a guarantee in case of default. **Capital** at the disposal of the borrower in terms of the equity or net worth of is carefully checked by the lender while the **condition** (purpose or use of the loan like consumption, production, welfare etc.) under which the loan is requested is of paramount importance for the lender.

3.6 References/Further Reading/Web Sources

- Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.
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- Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

3.7 Possible Answers to Self- Assessment Exercise(s)

1. The basis for credit transactions is, the trust, the trust that the banker has on his borrowers. No doubt the bank insists upon security for any loan, even then, the element of trust has greater say in the mind of the banker, before he takes a decision in considering the proposal of a prospective borrower. The questions that come to mind are: is the prospective loan seeker honest, and trustworthy, responsible? Is he a man of integrity? Does he have the ability and willingness to carry out the investment-income project from the beginning to the end? What do his past records suggest in these directions? The confidence which the institutional agency keeps is influenced by the moral qualities like honesty, integrity, commitment, hard work, promptness, etc., which the borrower exhibits. In essence it means the mental as well as moral characters of the borrower. Generally, people with good mental and moral character will have good credit character.

2. **Measures to strengthen risk bearing ability:**
These are: (1) developing owner's equity which is the backbone of risk bearing ability, (2) developing moral character i.e., honesty, integrity, dependability, bearing responsibility, etc., which are also called good credit rating, (3) reducing farm and family expenditure: (4) taking up stable and reliable enterprises, (5) providing ability to borrow in both good and bad periods, particularly during the bad periods, the farmer should get the funds, (6) creating ability to earn money and save money, i.e., an individual farmer may be very good in farming but part of the earnings should be saved to meet uncertainty, and (7) taking up crop and

Unit 4 Seven Ps' of Credit

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Principle of Productive Purpose
- 4.4 Principle of Personality
- 4.5 Principle of Productivity
- 4.6 Principle of Phased Disbursement
- 4.7 Principle of Proper Utilisation
- 4.8 Principle of Payment
- 4.9 Principle of Protection
- 4.10 Summary
- 4.11 References/Further Readings/Web Resources
- 4.12 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

The role of financial institutions in the light of the technological changes that have been brought in, on the agricultural front, lies in evolving principles of farm finance which are expected to bring not only commercial gains to the bankers but also social benefits. The principles thus evolved by the institutional agencies are supposed to have universal validity. These are popularly known as “Seven Ps’ of Credit.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:
explain the following:

- principle of productive purpose
- principle of personality
- principle of productivity
- principle of phased disbursement
- principle of proper utilisation
- principle of payment
- principle of protection.

4.3 Principle of Productive Purpose

When owned capital is a limiting factor on the farms, the credit needs of the farmers are many and varied. The requirements of credit commence right from short-term loans to long-term loans. This capital limitation is visible on all the farms but more pronounced on small and marginal farms. The farmers of these tiny holdings require another type of credit,

which the large farmers do not need i.e., the consumption loan. In the absence of consumption loans for the small and marginal farmers, the crop loans advanced may not be as productive as they are expected to be, because of their diversion to other purposes. But in spite of this known fact, the consumption credit is relegated to the backseat by the institutional agencies.

When the loan is diverted for other purposes, the productivity of the loan receives a setback and the desired results will be a far cry. But the principle of productive purpose says that loan distributed to any borrower should be capable of generating incremental income. If one wants the principle of productive purpose to hold good, the short-term loans of small and marginal farmers can be made productive, if they are provided with other income augmenting assets through term loans. The income generated from these productive assets will add to the income obtained from farming. In this process, the term loans not only turn out to be productive assets but also help in enhancing the productivity of crop loans taken by these categories of farmers. To cite some of the assets for which term loans are required are dairy animals, sheep and goat (grazing or stall-feeding), poultry, installation of pump sets on group action, etc.

4.4 Principle of Personality

The "Three Rs" which were explained earlier are the sound indicators of credit-worthiness of the farmers. Creditworthiness of the farmer makes him eligible for the loan he desires from the institutional agencies. Over the years of experience in lending, the bankers have identified an important factor in credit transactions, i.e., the trustworthiness of the borrower. It has relevance to personality of the individual. When the farmer borrower fails to repay the loan in the event of natural calamities, his is a case of non-willful default. He has to be bracketed in the category of defaulters, not by his own fault, but by the natural forces that influence farming, which are beyond the control of human beings. But a large farmer who profitably uses the loan, and still falls in the category of defaulters is a case of sheer willful default. This character is born out of the dishonesty of the individual. When this habit becomes perpetual with large farmers who borrow substantial funds, the very functioning of the institutional business gets crippled. Thus, the safety element of the loan is not totally dependent upon the security of the loan alone, but also on the personality (character) of the borrower. The growth and progress of the lending institutions have dependence on this major influencing factor, i.e., personality. The personality of the individual and growth of the financial institutions, thus are inter-linked.

4.5 Principle of Productivity

This principle stresses that the credit which is advanced is not just meant for increasing production from that enterprise alone, but should be able to increase the productivity of other factors employed in the enterprise. For example, for taking up any enterprise we need resources (factors of production), but the resource productivity (marginal value productivity) of the factors employed exhibit a varying trend among the enterprises chosen.

A few more examples in crop enterprises include preferring hybrid maize to open pollinated variety because it gives relatively higher returns and in livestock, selecting the breed which is superior among alternatives. Here, what we understand is that by our above decisions of varietal preference in crops, better competing crops and superior breeds, not only increase the returns by themselves, but also augment the productivity of other complementary factors employed in the respective production activities.

The main concern here is that since we are using scarce borrowed capital resources, no leaf should be left unturned in realising as much productivity as possible from each resource employed. Thus, this principle is centred around the point of making the resources as productive as possible by choosing the most appropriate enterprises.

4.6 Principle of Phased Disbursement

Ensuring the end-use of the funds is the most vital aspect of institutional lending. No enterprise or investment activity needs all the required funds at a time hence the funds requirement is spread over a period of time. In paddy enterprise, the need for capital is felt over 4 or 5 months for different operations, for sugarcane over one year and investment activities like digging a wash bowl or installation of pump sets require an altogether different time schedule. Relevant to this situation, the principle of phased disbursement underlines that the loan amount needs to be distributed in phases or spells to make it productive and the banker can also make himself doubly sure about the end-use of the borrowed funds. This procedure holds good in perennial crops and investment activities where the phased disbursal of the loan helps to overcome the misuse or diversion of funds, but the demerit of this system is that it will put the cost of credit on the higher sides.

4.7 Principle of Proper Utilisation

Proper utilisation implies using the borrowed funds for the purposes for which they have been advanced. It sounds pretty good because, every banker by heart and soul wishes this aspect for the mutual benefit. This,

to a certain extent, depends upon the climate prevailing in the rural areas. Explaining this a bit further, this means whether the farmers are getting the type of resources they need at the right time and in right quantities. Are the resources like seeds, fertilisers, pesticides, etc. free from adulteration to guarantee the farmer take full advantage of their use? Is the technical advice available with regard to production problems that crop up from time to time? Are the infrastructural facilities like storage, transportation, marketing, etc. available? Is the price stability in existence to help the farmer plan the cropping pattern for effective use of funds? Proper utilisation of funds is possible, when the suitable conditions for investment of funds exist.

4.8 Principle of Payment

This principle deals with the fixing of repayment schedules of the loans advanced by the institutional agencies. As far as the investment credit is concerned, say, irrigation structures, tractors, etc., the annual repayments are fixed over a given number of years depending upon the incremental returns that are supposed to be obtained after duly accounting for consumption needs of the farmers. With reference to crop loans (except perennial crops) the loan is to be repaid in lump sum because he gets the output only once. Two to three months are allowed after the harvest of the crop to enable the farmer get a reasonable price for his produce, otherwise, he will resort to distress sales. Whenever the crop fails due to unfavourable weather conditions, the repayment is not insisted upon immediately, and the repayment period is extended besides assisting the farmer with another fresh loan to enable him carry on the farm business.

Self-Assessment Exercises

1. Explain the principle of proper utilisation.
2. Mention the safety measures that guide the principle of protection.

4.9 Principle of Protection

In view of unforeseen calamities striking farming more often than not, banks cannot abstain themselves from extending loans to the farmers. Instead, what they do is that they demand the security for the advances they make, otherwise, the overdue resulting from non-payment of loans by the farmers owing to the natural calamities, affects the recycling of bank funds adversely. To tide over the situation of this nature, the institutional agencies resort to safety measures, viz., (i) insurance coverage, (ii) linking credit with marketing or tie up arrangement, (iii)

provision of finance on production of warehouse receipt (iv) taking securities.

a. Insurance Coverage

The loans for certain crops and investment activities like poultry, dairy, piggery, irrigation structures, etc., are insured. Suppose any eventuality breaks out and brings colossal loss to the farmers, it is beyond their capacity to repay the loan, more so if the affected happen to belong to small and marginal categories. Under such situations, the insurance agencies estimate the losses and indemnity is paid to the farmer, from which banks recover their dues.

b. Linking Credit with Marketing or Tie-up Arrangement

By linking credit with marketing, the banker is quite safe in recovering the loan. Let us take the case of a sugarcane grower-borrower who supplies cane to the factory as per the agreement. The loan particulars of the sugarcane farmer are let known to the sugar factory. As soon as the crop is harvested it is supplied to the factory. The factory will not pay the proceeds of the entire cane received, but deducts the loan component and the balance is paid to the grower. The loan amount so deducted will be credited to the bank against the loan amount taken by the farmer.

c. Provision of Finance against the Warehouse Receipt

When the prevailing product prices are not acceptable to the farmers, they need not submit to the situation. They can store the produce in the warehouse and based on the warehouse receipt, the financial institution advances loans to the extent of 75 percent of the value of the produce. It is a symbiotic process wherein the bank can recover loans and the farmers can derive price benefits when they sell after the glut period is over.

d. Taking Securities

The banks advance either by hypothecation or mortgage of assets.

4.10 Summary

In this unit, you have learnt the seven P's of credit as follows:

- the **principle of productive purpose** says that loan distributed to any borrower should be capable of generating incremental income;
- the **principle of personality** states that the personality of the individual and growth of the financial institutions are interlinked;
- the **principle of productivity** is centre around the point of making the resources as productive as possible by choosing the most appropriate enterprises;

- **the principle of phased disbursement** underlines that the loan amount needs to be distributed in phases or spells to make it productive and the banker can also make himself doubly sure about the end- use of the borrowed funds;
- **the principle of proper utilisation** implies using the borrowed funds for the purposes for which they have been advanced. Proper utilisation of funds is possible only when the suitable conditions for investment of funds exist;
- **the principle of payment** deals with extending the repayment period besides assisting the farmer with another fresh loan to enable him carry on the farm business;
- **the principle of protection** implies that the lending agency demand for some security on the advances they make, and take certain safety measures so that the recycling of the bank funds is not adversely affected.

4.11 References/Further Reading/Web Sources

- Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.
- Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.
- Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

4.12 Possible Answers to Self-Assessment Exercises

1. Proper utilisation implies using the borrowed funds for the purposes for which they have been advanced. It sounds pretty good because; every banker by heart and soul wishes this particular aspect for the mutual benefit. This, to certain extent, depends upon the climate prevailing in the rural areas. Explaining this a bit further, this means whether the farmers are getting the type of resources they need at the right time and in right quantities. Are the resources like seeds, fertilisers, pesticides, etc. free from adulteration to guarantee the farmer to take full advantage of their use? Is the technical advice available with regard to production problems that crop up from time to time? Are the infrastructural facilities like storage, transportation, marketing, etc. are available?
2. **Safety measures that guide the principle of protection are:**
 - (i) insurance coverage,
 - (ii) linking credit with marketing or tie up arrangement,
 - (iii) provision of finance on production of warehouse receipt
 - (iv) taking securities.

MODULE 5 ECONOMIC FINANCIAL TOOLS

Unit 1	Acquisition of Capital and Attendant Risks
Unit 2	Planning and Budgeting
Unit 3	Net Worth Statement
Unit 4	Income Statement

Unit 1 Acquisition of Capital and Attendant Risks

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Principle of Owner's Equity and Increasing Risk
- 1.4 Procedural Formalities in Sanction of Farm Loans
- 1.5 Repayment Plans
- 1.6 Summary
- 1.7 References/Further Readings/Web Resources
- 1.8 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

By all possible means, farm financial manager has to raise the needed capital for running the farm business. The sources through which he can raise the capital are savings that have been generated in the previous year or years and borrowings. For many farming households, credit (non-equity capital) is a *sine-quo-non* in running the farm business. As far as possible, credit transactions are maintained with the institutional agencies. In the utilisation of non-equity capital risk is an associated factor. This can be clearly explained with the principle of equity and increasing risk.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain the principle of owner's equity and increasing risk
- discuss the procedural formalities in sanction of farm loans
- explain repayment plans.

1.3 Principle of Owner's Equity and Increasing Risk

This principle hinges upon the fact that the risk in farming tends to increase at an increasing rate, as the owner's equity decreases. When owned capital (equity capital) is limited with the farmers, borrowings will become necessary to raise needed capital for production. It is necessary here to mention leverage, which is nothing but the ratio of debt to equity. The leverage will be higher on the farms using more and more of non-equity capital. As the leverage stands higher and the farmers get expected returns, it contributes to the prosperity of the farm business. The non-equity capital is productive, when everything goes right on farms, but it is equally destructive when the farmer's expectations go topsy-turvy. The borrowed capital which earlier brought prosperity to the farmers now spells doom.

a. Statement of the principle

As the debt-equity ratio or leverage increases, the borrower runs a greater risk of losing owned capital. This principle is clearly explained with the example presented in Table 16. Before that, we should state the formula of percentage of equity.

$$\text{Percentage of equity} = \frac{\text{Owned capital}}{\text{Owned capital} + \text{Borrowed capital}} \times 100$$

We can consider five farms with an identical owned capital of ₦5,000 each. Apart from farm A, the other four farms have borrowed an amount of ₦2,500, ₦5,000, ₦7,500 and ₦10,000 respectively. Consequently, the total capital available with A, B, C, D and E farms will exhibit an increasing trend. Assuming a 15 percent uniform gain on all the farms, the resultant profit would be ₦750, ₦1,125, ₦1,500, ₦1,875, ₦2,250 on the corresponding farms.

After paying the interest to the lending agency, owned capital increased in ascending order for the respective farms in question. The percentage gain on owned capital too, exhibited a similar trend. Now, let us assume that there is a 15 percent loss uniformly on the five farms. Analogous to the profit trend, the loss calculated too reveals an increasing trend on farms A, B, C, D, and E respectively. The position of owned capital after the loss resulted in progressive decline leading to increased percentage loss on owned capital on the above farms. An overview of the particulars in Table 16 infers that, **as the borrowed funds increase, the percentage of equity gets reduced under the condition of losses.** No doubt borrowed capital is productive as long as there is no setback, but in the context of any eventuality, it is equally destructive to the farmer. **This amply demonstrates that credit is a double-edged knife and hence the requisite amounts only, need to be borrowed by the farmers.**

1.4 Procedural Formalities in Sanction of Farm Loans

The financial bank is vested with the powers either to accept or reject the farmer's loan application. This is sequel to an objective appraisal of farm credit proposals and procedures and formalities followed in the processing of loans. Here, an attempt is made to explain the set of procedures and formalities required in processing a farm loan application. The processing procedure is detailed under the following sub-heads:

1. Interview with the farmer;
2. Submission of loan application by the farmer;
3. Scrutiny of records;
4. Visit to the farmer's field before sanction of loan;
5. Criteria for loan eligibility;
6. Interview with the farmer;
7. Submission of loan application by the farmer;
8. Scrutiny of records;
9. Visit to the farmer's field before sanction of loan;
10. Criteria for loan eligibility;
11. Sanction of loan;
12. Submission of requisite documents;
13. Disbursement of loan;
14. Post-credit follow-up measures; and
15. Recovery of loan.

Table 1.1: Principle of Equity and Increasing Risk

S/No	Items	FARMS				
		A	B	C	D	E
1	Owned capital (equity capital) (₹)	5,000	5,000	5,000	5,000	5,000
2	Borrowed capital (non-equity capital) (₹)	-	2,500	5,000	7,500	10,000
3	Owned + borrowed capital (Total capital) (₹)	5,000	7,500	10,000	12,500	15,000
4	Leverage ratio	0	0.5	1.0	1.5	2.0
5	Gain @ 15% on total capital	750	1,125	1,500	1,875	2,250
6	Interest to be paid to the Institutional agency @ 12%	-	300	600	900	1,200

7	Owned capital @ at the end of the year (₹)	5,750	5,825	5,900	5,975	6,050
8	Gain on owned capital in %	15.0	16.5	18.0	19.5	21.0
9	Loss @15% on total capital	750	1,125	1,500	1,875	2,250
10	Interest to be paid to the Institutional agency @ 12%	-	300	600	900	1,200
11	Owned capital at the end of the year (₹)	4,250	3,575	2,900	2,225	1,550
12	Loss on owned capital %	15.0	28.5	42.0	55.5	69.0

1. Interview with the Farmer

A banker studies the farmer-borrower in the interview regarding his credit characteristics such as honesty, integrity, frankness, progressive thinking, indebtedness, repayment capacity, etc. The banker explains to the farmer the terms and conditions under which the loan is going to be sanctioned. The interview helps the banker to understand the genuine credit needs of the farmer. So, interview is more than a mere formality, as it facilitates the banker to study the farmer in detail and assess his credit requirements.

2. Submission of Loan Application by the Farmer

After getting satisfied with the credentials of the farmer, the banker gives a loan application form to him. Details regarding the location of the farm, purpose of the loan, cost of the scheme, credit requirements, farm budgets, financial statements, etc, as required in the form are filled in by the farmer. Certificates indicating ownership of the land or title deeds and statement showing cropping pattern adopted by the farmer-borrower, farm map and passport size photograph is affixed to the loan application form.

3. Scrutiny of records

The ownership and extent of land as indicated in the relevant certificates are verified by the bank officials with village or clan heads and other appropriate authorities.

4. Visit to the Farmer's Field before Sanction of Loan

After verifying the records, the Field Officer of the bank pays a visit to the farm to verify the particulars given by the farmer. The pre-sanction visit is expected to help the banker to identify the farmer and guarantor, locate the boundaries of land as per the map, assess the managerial

capacity of the farmer in farming and allied enterprises and the farmer's attitude towards latest technology. Details on economics of crop and livestock enterprises, feasibilities for implementing proposed plans, farmer's loan position with the non-institutional sources are ascertained in the pre-sanction visit. Thus, pre-sanction visit of the bank officials is very important to verify credit-worthiness and trust-worthiness of the farmer-borrower. While appraising different types of loans, different aspects should be verified. For example, to advance loan for borehole and wash bowl digging, the location of the proposed borehole, ground water availability, distance from the nearby borehole, rainfall, command area of the well, etc., are verified in the pre-sanction visit.

Similarly, for other loans, the pertinent aspects are verified. All these aspects are included in the report submitted to the Branch Manager to take final decision in the sanction of the loan.

5. Criteria for Loan Eligibility

The following aspects are considered in judging the eligibility of a farmer-borrower to receive loan:

- (a) He should have sound character and financial integrity.
- (b) His dealings with friends, neighbours, financial institutions, etc., must be proper (he should not be a defaulter in the past).
- (c) He must have progressive outlook and be receptive to modern technology.
- (d) He should sincerely implement the proposed scheme and ensure proper use of credit.
- (e) The security provided by the farmer must be free from any sort of encumbrance and litigation.

6. Sanction of Loan

After examining all the aspects presented in the pre-sanction farm inspection report, the Branch Manager takes a decision whether to sanction the loan or not. Before sanctioning, the Branch Manager considers the technical feasibility, economic viability and bankability of proposed projects including the repayment capacity, risk-bearing ability and sureties offered by the farmer-borrower. If the loan amount is beyond the sanctioning power of the Branch Manager, it is forwarded to the Regional Manager or Head Office of the bank, incorporating his recommendations. The authorities at the respective offices take the final decision on the proposed projects and communicate their decision to the Branch Manager for further action.

7. Submission of Requisite Documents

After sanctioning the stipulated amount to the farmer-borrower, some further documents are obtained like guarantors' letter and mortgage

deeds. Title deeds are examined by the legal officer of the bank and his opinion with regard to clear, marketable and unmitigated title is sought. Simple mortgage is followed in the case of acquired property and equitable mortgage or registered mortgage in respect of ancestral property. However, the opinion of the bank's legal officer is obtained in this regard. Mortgage of land is done prior to obtaining non-encumbrance certificate and sanction of loan.

8. Disbursement of Loan

As soon as the execution of documents is completed, the loan amount is credited to the borrower's account. The loan amount is disbursed in a phased manner, that too after ensuring that the loan is used by the farmer-borrower properly. A realistic repayment plan is framed and given to the farmer keeping in view the income flow of the proposed project.

9. Post-credit Follow-up Measures

The Branch Manager or Agricultural Officer pays a visit to the farmer to ascertain the proper use of the credit. This also benefits the farmer, for, they can get the technical advice if any needed from the Agricultural Officer in the implementation of the scheme. These visits are also meant for developing a close rapport between the farmer and the banker. These visits are more informal than formal, which are supposed to inculcate the feeling of friendliness and underlying the obligation of the farmer to repay the loan when it falls due. Such visits also facilitate in assessing any further requirement of supplementary credit to complete the scheme.

10. Recovery of Loan

The bank reminds the farmer-borrower in advance about the repayment of loan in time. If needed, special drives, village meetings, etc. are organised at an appropriate time. All appropriate measures are taken to persuade the farmer-borrower to repay the loan in time. In the case of failure, the reasons for the same are ascertained to find out whether the borrower is a deliberate defaulter or not. If the reason is genuine, the borrower is further helped by extending finance to accelerate farm production. In such situations, a closer supervision is necessary. If the bank officials find that the borrowers are willful defaulters, stringent measures are initiated to recover the loans through court of law. In all possible cases the bank officers make tie-up arrangements, i.e. the recovery of the loan is linked with marketing. Re-phasing of repayment plan is allowed in the case of justifiable cases.

Self-Assessment Exercises

1. Outline any four criteria for loan eligibility.
2. List the various repayment plans in vogue.

1.5 Repayment Plans

For term loans which are characterised by partially liquidating nature, the loan repayment plan is not as similar as that of short-term loans. These loans are recovered through a given number of installments depending upon the nature of asset and the amount advanced for the asset in question.

Various repayment plans in vogue are listed and briefly explained here:

- (i) Straight-end payment plan or single repayment plan or lump sum repayment plan.
- (ii) Partial repayment plan.
- (iii) Amortised repayment plan.
 - (a) Amortised decreasing repayment plan.
 - (b) Amortised even repayment plan.
- (iv) Variable repayment plan.
- (v) Optional repayment plan.
- (vi) Reserve repayment plan.

a. **Straight-end Payment Plan or Single Repayment Plan or Lump Sum Repayment Plan**

The entire loan amount is to be cleared off after the expiration of loan period stipulated. More clearly in this method, the principal component is repaid by the farmer at a time in lump sum when the loan matures, while the interest component is paid each year.

b. **Partial Repayment Plan or Balloon Repayment Plan**

The farmer is expected to settle the entire loan amount in quarterly, half-yearly or annual installments (principal + interest). It implies that repayment of loan will be done partially over the years. Usually, the installment amount will be decreasing as the years pass by except in the maturity year (final year) during which the investment would have generated sufficient revenue for liquidation. Table 17 illustrates this.

Example:	Loan amount	₹10,000
	Time period	6 years
	Rate of interest	12%

This is also known as balloon repayment plan, as the large final payment is made at the end of the loan period following a series of smaller partial payments.

c. **Amortised Repayment Plan**

It is an extended version of partial repayment plan. Amortisation means the repayment of the entire loan amount in a series of

installments. Here, we have two types of amortisation plans, viz., amortised decreasing repayment plan and amortised even repayment plan.

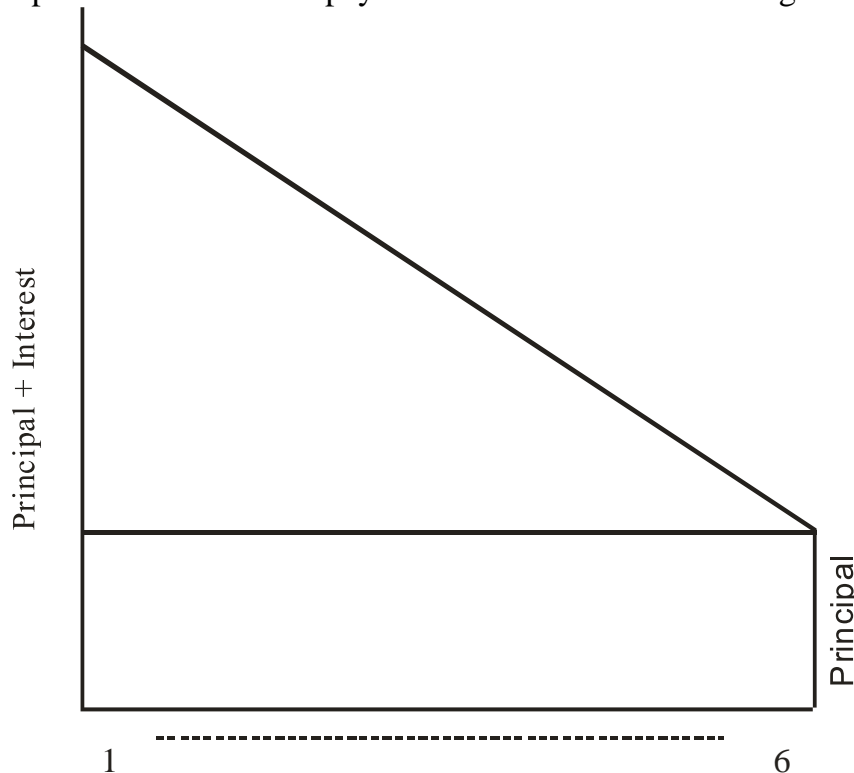
Table 1.2: Partial Repayment Plan

Year	Principal (₦)	Interest (₦)	Instalment (₦)	Balance amount (₦)
1	1,000	1,200	2,200	9,000
2	1,000	1,080	2,080	8,000
3	1,000	960	1,960	7,000
4	1,000	840	1,840	6,000
5	1,000	720	1,720	5,000
6	5,000	600	5,600	-
Total	10,000	5,400	15,400	-

A. Amortised Decreasing Repayment Plan

In this repayment plan, the principal component remains constant over the entire repayment period, while the interest part decreases continuously.

With the principal amount remaining fixed and interest amount decreasing, the annual installment amount decreases over the years. The advance made for the purchase of machinery is one of the suitable examples under this category, for the machinery does not demand much repairs in the initial years of loan payments enabling the farmer to repay a large amount of installments in the initial years. The diagrammatic representation of the repayment schedule is shown in Figure 1.1.



Year

Figure 1.1: Amortised Decreasing Repayment Plan

The arithmetic calculation of the plan is embodied in Table 18.

Example: Loan amount ₦10,000
 Time period 6 Years
 Rate of interest 12%

Table 1.3: Amortised Decreasing Repayment Plan

Year	Principal (₦)	Interest (₦)	Instalment (₦)	Balance amount (₦)
1	1,666.67	1,200	2,866.67	8,333.33
2	1, 666.67	999.99	2,666.66	6,666.67
3	1, 666.67	799.99	2,466.66	5,000.00
4	1, 666.67	600.00	2,266.67	3,333.33
5	1, 666.67	399.99	2,066.66	1,666.67
6	1, 666.67	199.99	1,866.67	-
Total	10,000.00	4,199.96	14,199.96	-

B. Amortised Even Repayment Plan

This is called equated annual instalment method. The annual instalment over the entire loan period remains the same in this method. The principal portion of the instalment increases continuously, while the interest part declines gradually. This method is mostly adopted for term loans. Loans granted for farm development, digging of wash bowls or bore holes, dairy, poultry, etc., are the examples. This is depicted diagrammatically in Figure 1.2.

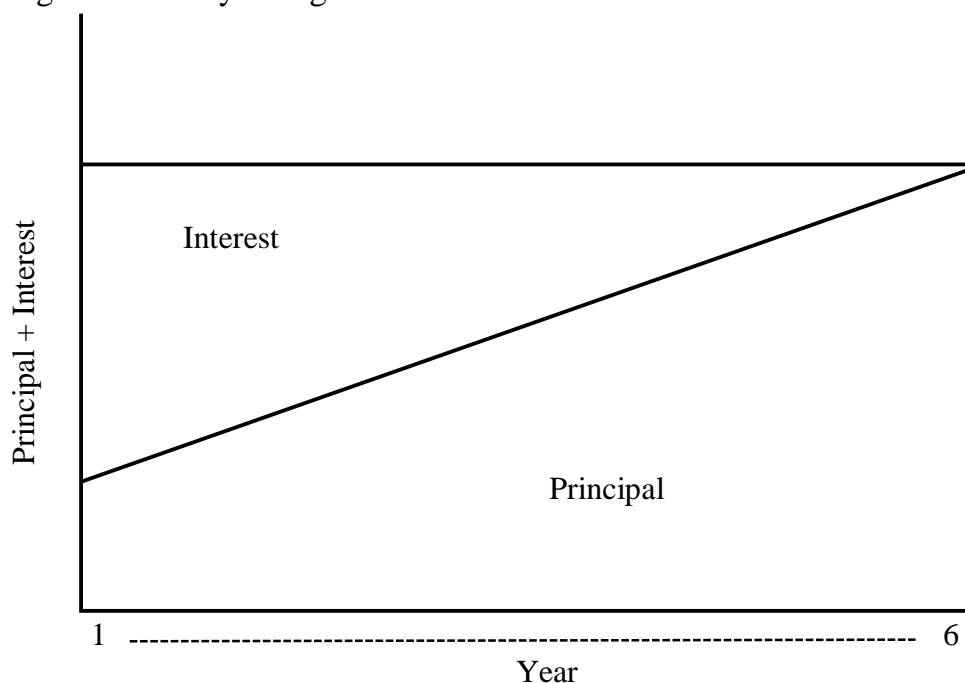


Figure 1.2: Amortised Even Repayment Plan

The annual instalment is arrived at through the formula given below:

$$I = B \frac{i}{1 - (1 + i)^{-n}}$$

Where,

I = Annual instalment in ₦

B = Principal amount borrowed in ₦

n = Loan period in years

i = Annual interest rate in fraction

The plan is shown in Table 6.8

Example:	Loan amount	₦10,000
	Time period	6 years
	Rate of interest	12%

$$\begin{aligned} I &= B \frac{i}{1 - (1 + i)^{-n}} \\ &= 10,000 \frac{0.12}{1 - (1 + 0.12)^{-6}} \\ &= 10,000 \frac{0.12}{1 - \left(\frac{1}{(1.12)^6}\right)} \\ &= 10,000 \times 0.243225 \\ &= \text{₦}2,432.25 \end{aligned}$$

Table 1.4: Amortised Even Repayment Plan

Year	Instalment (₦)	Principal (₦)	Interest (₦)	Balance amount (₦)
1	2,432.25	1,232.25	1,200.00	8,767.75
2	2,432.25	1,380.12	1,052.13	7,387.63
3	2,432.25	1,545.73	886.52	5,841.90
4	2,432.25	1,731.22	701.03	4,110.68
5	2,432.25	1,938.97	43.28	2,171.71
6	2,432.25	2,171.64	260.61	-
Total	10,000.00	9,999.93	4,593.57	

d. Variable Repayment Plan

As the very name indicates, various levels of instalments are paid by the borrower over the loan period. In times of good harvest, a higher instalment is paid, while in periods of low yield lesser amount is credited towards instalment to the lender. According to the convenience,

the borrower effects the repayment. This method is not found with institutional borrowings.

e. Optimal Repayment Plan

In this method provision is made for the borrower to make payment towards the principal amount in addition to the regular interest annually.

f. Reserve Repayment Plan or Future Payments

This type of repayment is made by the borrowers in areas which are subject to high income variability of farms. The impending problem here is that the farmers are haunted by the fear that they may not be able to keep up their promise of repaying crop loans or instalments towards term loans at scheduled time. To overcome such situations, the farmers make advance payments of the loan realised from the savings of the previous year. The farmer is not a loser in this transaction by any means since he is paid interest at the rate charged on the loans for the advance amount credited. This type of repayment is advantageous to the banker as the institutional agency need not worry regarding loan collection during the periods of crop failure. The farmer too gains here as he can keep up his integrity in credit transactions.

1.5 Summary

The principle of owner's equity and increasing risk, procedural formalities in sanction of farm loans and repayment plans were discussed in this unit.

- You have learnt that the principle of owner's equity hinges upon the fact that the risk in farming tends to increase at an increasing rate, as the owner's equity decreases.

Leverage is the ratio of debt to equity which becomes higher on the farms using more and more of non-equity capital. As the leverage gets higher with more borrowed capital, the farmer gets expected returns and the prosperity of the farm business increases. However, if the farmer incurs losses, the effect is destructive. Therefore, credit is a double-edged knife and hence the requisite amounts only, need to be borrowed by the farmers.

- In this unit, you have also learnt the set of procedures and formalities required in processing a farm loan application and the various repayment plans in vogue particularly:
 - ✓ Straight-end payment plan or single repayment plan or lump sum repayment plan;
 - ✓ Partial repayment plan;
 - ✓ Amortised decreasing repayment plan;

- ✓ Amortised even repayment plan;
- ✓ Variable repayment plan;
- ✓ Optional repayment plan; and
- ✓ Reserve repayment plan.

1.6 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

1.7 Possible Answers to Self-Assessment Exercise(s)

1. The following aspects are considered in judging the eligibility of a farmer-borrower to receive loan:
 - (a) He should have sound character and financial integrity.
 - (b) His dealings with friends, neighbours, financial institutions, etc., must be proper (He should not be a defaulter in the past).
 - (c) He must have progressive outlook and be receptive to modern technology.
 - (d) He should sincerely implement the proposed scheme and ensure proper use of credit.
 - (e) The security provided by the farmer must be free from any sort of encumbrance and litigation. (Any 4).

2. **Various repayment plans in vogue are:**
 - a. Straight-end payment plan or single repayment plan or lump sum repayment plan.
 - b. Partial repayment plan.
 - c. Amortised repayment plan.
 - a. Amortised decreasing repayment plan.
 - b. Amortised even repayment plan.
 - d. Variable repayment plan.
 - e. Optional repayment plan.
 - f. Reserve repayment plan.

Unit 2 Planning and Budgeting

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 What is Planning?
- 2.4 Need for Planning
- 2.5 Planning Techniques: Budgeting
- 2.6 Summary
- 2.7 References/Further Readings/Web Resources
- 2.8 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

Every farm financial manager has to assess the performance of his business, in order to act suitably. Various tools of financial analysis, viz., farm planning and budgeting, the balance sheet, income statement, cash flow statement, break-even-analysis etc., are available to him in this regard. These tools are presented in five segments. This unit treats the introductory part while the others are treated in subsequent units.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define planning
- explain the need for planning
- explain budgeting technique
- enumerate the advantages of budgets
- discuss the difference between partial and complete budgets.

2.3 What is Planning?

Farm planning and budgeting are the most important tools of farm business analysis. The most profitable alternative enterprises are selected in the planning process by organising the available land, labour and capital resources into proper combinations. Any scheme of action prepared in advance to attain the set objectives is a plan. A farm plan is a scheme for operation and organisation of farm business to get maximum net returns. Planning refers to the process of formulating a plan. In planning, we specify as to how land is to be allotted among alternative profitable enterprises and how limited capital and fixed family labour are most profitably combined in different periods of time to produce desired crop and livestock products.

Economic principles provide the guidelines and rules and simplify the complex decision problems of what to produce, how to produce and how much to produce from crops and livestock enterprises, under the given set of resources. Plans give a systematic and organised procedure by exactly specifying the enterprises and their resource requirements. In fact, a farm manager must formulate sound alternative farm plans and budgets in order to be a successful farm manager. In plans, we specify the enterprises along with their resource requirements in physical units but in budgeting, we account for their monetary value for judging their profitability.

2.4 Need for Planning

The need for farm plans stems from the desire of the farmer to attain his set goals and objectives. New ideas and information on technology of farms must be gathered and put into plan for execution, if the farmer aims at achieving higher returns from his given resources. Careful examination of the resources and their efficiencies must be ensured along with minimisation in wastages. Judicious use and combination of resources for producing existing and new enterprises, which have potential for furthering income and employment of family labour on a continuous time basis, must be allowed in plans. Sources of procuring the requisite credit along with other essential inputs, marketing, arrangements for sale of output, risk and uncertainties in production and marketing, prevention of unnecessary stresses and strains in the use of resources etc., must be considered in making good plans.

A good plan must be useful in seeing the future requirements. It must be flexible to suit the changes in the weather, market and farm environment. It should provide food, cash and fodder requirements in combining the crop and livestock enterprises. There should be provision in plans for crop rotation to maintain and improve soil fertility. It should satisfy the stated objectives of the farmer and consider inventory of the scarce resources and financial constraints. Technical coefficients along with techniques of organising the scarce resources and enterprises must be given due consideration in formulating the plans.

2.5 Planning Techniques: Budgeting

Some techniques are simple, while others are more complex. Budgeting is the most informal method, whereas linear programming and non-linear programming are the most sophisticated techniques for providing appropriate solutions under certainty, risk and constrained situations.

In budgeting process, we estimate costs, returns and net profit of a farmer or a particular enterprise and, hence, it helps in advance

estimation of expenses and income of a farm business. Budgets are usually prepared for a year, considering the revenue and expenditure. When budgeting is done for a single enterprise or two enterprises then it is called partial budgeting. If budgeting is done for all the enterprises in terms of costs, revenues and net profits for the whole farm, then it is termed as complete budgeting or total budgeting or whole farm budgeting. In this process, the best combination of enterprises is judged based on the productivity of the resources and the ability of the farm operator to maximise the returns. Budgeting has several implications in farm financial management. Farm budgets assist the farmer in exercising economic control over his farm business. They also help the lending institutions in decisions like justifying the sanction of loan or rejection of the same. Credit needs of the farmer in different time periods of the year are vividly shown by the budgets. Budgets also help in fixing the repayment schedules and sanction of loans at appropriate time. Thus, budgets form a basis to determine the quantum of credit to be given to a particular farm.

a. Advantages of budgets

The following are the advantages of budget:

(1) Estimation of economic viability of agricultural development projects, (2) judging the repayment capacity of the farmer, (3) reorganising the resources and enterprises for amortising the loans, (4) preparation of cash-flow statements, (5) assessment of credit requirements of the farmers in different seasons of a year, and (6) maximisation of net returns from the farm.

b. Partial and complete budgets

The two types of budgets, i.e., partial and complete distinctly differ from each other in the following ways. In partial budgeting, we try to introduce minor changes like, use of high yielding variety of seeds, different doses of fertiliser use, etc., and their corresponding costs and returns in terms of added costs and added returns and bring forth the impact of these minor changes on returns of the enterprise. In complete budgeting, we contemplate complete transformation in enterprises bringing about desired changes in methods of production, techniques of adoption, etc. By doing so, sometimes new potential enterprises are selected, replacing the traditional ones. In partial budgeting, only a few alternatives with a good range of profit are considered, while in complete budgeting all the possible alternatives without omission are tried, and the best one is selected in terms of profits. Partial budgeting is done for a part of the farm business only, while in complete budgeting entire farm is considered and the best profitable alternatives are chosen.

Self-Assessment Exercises

1. Why should a farmer plan?
2. State any five advantages of budget.

c. **Budgeting**

This is a kind of partial budgeting, but strictly refers to one enterprise in terms of its importance and frequent use in farm planning. It is a prerequisite for the preparation of partial budgeting, complete budgeting and programming models.

An enterprise budget considers the expected or average requirement of inputs and their corresponding average output, which are called technical coefficients. These technical coefficients are expressed both in physical units and value terms for a unit of particular activity. Such enterprise budgets are prepared for production activities on farms which indicate returns over variable costs per unit of activity. Thus, physical input-output data along with price data on inputs and output are essential for preparing enterprise budgets. Crop enterprise budgets relate to individual crop production activities, while livestock enterprise budgets pertain to milk, eggs, wool, mutton, etc. Several budgets are often formulated for the same enterprise or crop activity if there is change in technical coefficients for the enterprise.

2.6 **Summary**

In this unit, you have learnt that:

- Farm planning and budgeting are the most important tools of farm business analysis.
- Planning refers to the process of formulating a plan.
- In planning, we specify as to how land is to be allotted among alternative profitable enterprises and how limited capital and fixed family labour are most profitably combined in different periods of time to produce desired crop and livestock products.
- Planning helps the farmer to achieve his set goals.
- It is necessary to give due considerations to technical coefficients along with techniques of organising the scarce resources in formulating plans.
- Budgeting is the most informal and perhaps the simplest method of planning whereas
- Budgets form a basis to determine the quantum of credit to be given to a particular farm
- In partial budgeting we introduce minor changes but in complete budgeting we contemplate complete transformation in enterprises bringing about desired changes in methods of production, techniques of adoption, etc. It thereby means that new potential enterprises can be selected to replace the traditional ones.
- In partial budgeting, only a few alternatives with a good range of profit are considered, while in complete budgeting all the

possible alternatives without omission are tried, and the best one is selected in terms of profits.

- Enterprise budgeting is a kind of partial budgeting, but strictly refers to one enterprise in terms of its importance and frequent use in farm planning.
- It is a pre-requisite for the preparation of partial budgeting, complete budgeting and programming models.

2.7 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press, Ames.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

2.8 Possible Answers to Self-Assessment Exercise(s)

The need for farm plans stems from the desire of the farmer to attain his set goals and objectives. New ideas and information on technology of farms must be gathered and put into plan for execution, if the farmer aims at achieving higher returns from his given resources. Careful examination of the resources and their efficiencies must be ensured along with minimisation in wastages. Judicious use and combination of resources for producing existing and new enterprises, which have potential for furthering income and employment of family labour on a continuous time basis, must be allowed in plans. Sources of procuring the requisite credit along with other essential inputs, marketing, arrangements for sale of output, risk and uncertainties in production and marketing, prevention of unnecessary stresses and strains in the use of resources etc., must be considered in making good plans.

2. Advantages of Budgets

- (1) Estimation of economic viability of agricultural development projects.
- (2) Judging the repayment capacity of the farmer.
- (3) Reorganising the resources and enterprises for amortising the loans.
- (4) Preparation of cash-flow statements.
- (5) Assessment of credit requirements of the farmers in different seasons of a year.
- (6) Maximisation of net returns from the farm (**Any 5**).

Unit 3 Net Worth Statement

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 The Net Worth
- 3.4 Precautions in Preparing the Balance Sheet of a Business Farm (Firm)
- 3.5 Test Ratios
- 3.6 Summary
- 3.7 References/Further Readings/Web Resources
- 3.8 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

As part of budgeting tool, the net worth, which is a stock concept, is needed for decision making regarding the farm business to show the solvency of the business in case it has to be liquidated. It is also referred to as the balance sheet.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- prepare the net worth statement
- estimate the test ratios
- interpret the test ratios.

3.3 The Net Worth

Any farmer, whether small, medium or large, measures financial performance of the farm business during an agricultural year or over a period of time. There is a possibility in the variation of degree of keenness that is shown by the different categories of farmers. In other words, as the size of the farm gets increased, the capital requirement too gets enlarged, forcing the farmer to be more vigilant in running the farm business, since the risk element is much higher in the event of any unforeseen eventuality. Management component plays a pivotal role in managing higher financial outlays. Nevertheless, management of finance is equally important even for a small farmer.

The balance sheet indicates an account of total assets and total liabilities of the farm business revealing the financial solvency of the business. More specifically, it is a statement of the financial position of a farm business at a particular time, showing its assets, liabilities and equity. If the assets are more than liabilities, it is called net worth or equity and its

converse is known as net deficit. The typical balance sheet (Table 3.1) shows assets on the left side and liabilities and equity on the right side. Both sides are always in balance hence the name balance sheet. Net worth is placed on the right side along with liabilities, in order to indicate that like any other creditor the farmer has a claim against the farm business equal to the equity amount. The balance sheet can be easily prepared by the farmer if farm records are available. It can be prepared at any point in time to know the financial position of the farm business. It can also be prepared to study the performance of a business over years by preparing the same number of balance sheets. If the net worth increases over the different periods, it indicates efficient performance of the business. To prepare a balance sheet, the prime requisites are total assets and total liabilities of the farm.

Assets: Assets are those which are owned by the farmer.

Liabilities: These refer to all things which are owed to others by the farmer.

Assets are of three types, viz. current, intermediate or working and long-term or fixed. So also, are the liabilities. This classification of assets facilitates the analysis of liquidity of the farm business.

Current assets: They are very liquid or short-term assets. They can be converted into cash, within a short time, usually one year. For example, cash on hand, agricultural produce ready for disposal, i.e., stocks of yam, maize, millet, etc.

Intermediate or working assets: These assets take two to five years to convert into cash form. Example: machinery, equipment, livestock, tractors, trucks, etc.

Long-term assets or fixed assets: An asset that is permanent or will be used continuously for several years is called a long-term asset. It takes longer time to convert into cash due to verification of records, legal transactions, etc. Examples: land, farm buildings, etc.

Current liabilities: Debts that must be paid in the short term or in very near future. Examples: crop loans, other loans, cost of maintenance of cattle, etc.

Intermediate liabilities: These loans are due for the repayment within a period of two to five years. Examples: livestock loans, machinery loans, etc.

Long-term liabilities: The duration of loan repayment is five or more years. Examples: tractor loan, orchard loan, land development loan, etc

Table 3.1: Balance Sheet of a Hypothetical Farm

Assets	Amount (in ₹)	Liabilities	Amount (in ₹)
Current Assets:		Current Liabilities:	
Cash on hand	10,000	Crop loans to be repaid to institutional agencies	8,000
Savings in bank	8,000		
Value of grains ready for disposal	38,500	Cost of cultivation (excluding loans)	6,000
Livestock products (eggs, birds, etc.)	60,000	Other loans (unsecured loans due for immediate repayment)	5,000
Fruits, vegetables, fodder and feed ready for sale	8,000	Cost of maintenance of cattle	3,600
		Costs of poultry enterprise	25,000
Fertiliser in stock	2,000	Annual installments	19,000
Sub-total	126,500	Sub-total	66,600
Intermediate assets:		Intermediate liabilities:	
Dairy cattle	10,000	Livestock loans	8,000
Bullocks	9,000	Machinery loan	15,000
Poultry birds	15,000	Unsecured loans	10,000
Machinery and equipment	15,000		
Tractor	175,000		
Sub-total	224,000	Sub-total	33,000
Long-term assets:		Long-term liabilities:	
Land (book value)	600,000	Tractor loan	120,000
Farm buildings	25,000	Orchard loan	25,000
		Unsecured loans	10,000
Sub-total	625,000	Sub-total	155,000
Total of assets	975,500	Total of liabilities	254,600
		New worth or equity =	720,900

3.4 Precautions in Preparing the Balance Sheet of a Business Farm (Firm)

- i) Accuracy with regard to valuation of assets is difficult in the absence of records, hence approximations to such valuations need to be defined with reference to a given time period. All farm products say, paddy, pulses, oilseeds, livestock and livestock products, etc., should be valued based on the market price. Land

- and other non-liquid assets should be valued based on prevailing sale value for similar type of land at the same time period.
- ii) While valuing the durable assets, book value method is no doubt a good procedure but subject to criticism. Book value method refers to the realistic value of an asset giving due allowance for depreciation and improvement. Hence, book value is neither the market price nor purchase price, but value at cost i.e. valuing at cost. For example, a farmer bought his farm lands in different time periods say, 2001 and 2011, book value of these lands should be determined after giving an allowance for depreciation and improvements made on the land.
- iii) In periods of inflation, the values for durable assets rise. Under such situations, it is desirable to make adjustments in the values of the assets, while entering the same in the balance sheet.

Self-Assessment Exercises

1. Distinguish between liabilities and current assets.
2. Describe net capital ratio and acid test ratio stating their mathematical models.

3.5 Test Ratios

The test ratios, viz. current ratio, intermediate ratio, net capital ratio, quick ratio, current liability ratio, debt-equity ratio and equity-value ratio can be derived from the balance sheet.

$$\begin{aligned}
 \text{i. } \quad \text{Current ratio} &= \frac{\text{Total current assets}}{\text{Total current liabilities}} \\
 &= \frac{126,500}{66,600} = 1.90
 \end{aligned}$$

This ratio indicates the capacity of the farmer to meet immediate financial obligations (liquidity). If current assets are more than current liabilities and if the borrower fails to repay the loan, his is a case of willful-default in spite of his position being solvent. This type of willful default is more common in respect of large farmer-borrowers of financial institutions. If by chance the ratio falls less than one due to certain unforeseen contingencies, his case for further lending cannot be ruled out by the institutional agencies, as it is a temporary set-back and he may be given a chance to prove his creditworthiness. A ratio of more than one indicates a favourable run of the farm business. Current ratio reflects liquidity within one year's time.

ii. Intermediate or working ratio =

$$\frac{\text{Total current assets} + \text{Total intermediate assets}}{\text{Total current liabilities} + \text{Total intermediate liabilities}}$$

$$\frac{126,500 + 224,000}{66,600 + 33,000} = \frac{350,500}{99,600} = 3.52$$

This indicates the liquidity position of the farm business over an intermediate period of time, ranging from 2 to 5 years. Here, certain time is allowed for the farmer to build up the farm business to improve his liquidity position. This ratio should also be more than one to indicate sound running of the farm business. The progressive intermediate ratio observed for giving farm business over time implies, the increase in the value of current and intermediate assets due to minimal physical loss and price decline. The steady growth of this ratio over a period is a healthy sign of the business.

iii. Net capital ratio = $\frac{\text{Total assets}}{\text{Total liabilities}}$

$$= \frac{975,500}{54,600} = 3.83$$

It indicates the long-term liquidity position of the farmers. If the net capital ratio is more than one, the funds of institutional agencies are safe. A consistently increasing ratio over the years reveals the sound financial growth of farm business. The farmer with this record should be very prompt in repayment of all types of credit obligations. This ratio is also the most important measure of overall solvency position of the farmer-borrowers.

iv. Acid test ratio or quick ratio =

$$\frac{\{\text{Cash receipts} + \text{accounts receivable} + \text{marketable securities} \\ (\text{bonds, shares etc. available in more than one year})\}}{\text{Total current liabilities}}$$

This reflects adequacy of cash and income surpluses to cover all current liabilities during the period of one to two years. If there is no difference in income position of a farmer within that period, current ratio and acid test ratio reflect the same position.

v. *Current liability ratio* = $\frac{\text{Current liabilities}}{\text{Owner's equity}}$

$$= \frac{66,600}{720,900} = 0.09$$

This ratio indicates the farmer's immediate financial obligations against the net worth. A ratio of less than one indicates a healthy performance of the farm business and over the years the ratio should become smaller and smaller to reflect a consistently good performance.

$$\begin{aligned} \text{vi. Debt – equity ratio (Leverage ratio)} &= \frac{\text{Total debts}}{\text{Owner's equity}} \\ &= \frac{254,600}{720,900} = 0.35 \end{aligned}$$

This presents the capacity of the farmer to meet the long-term commitments. Also, it throws light on the extent of indebtedness in the farm business or conversely the amount of capital raised by the farmer in running the farm business. A consistently falling ratio indicates a very heartening performance of farming and the ability of the farmer to reduce dependence on borrowings.

$$\begin{aligned} \text{vii. Equity – value ratio} &= \frac{\text{Owner's equity}}{\text{Value assets}} \\ &= \frac{720,900}{975,500} = 0.74 \end{aligned}$$

This ratio highlights the productivity gained by the farmer in relation to the assets he has. The improvement in the ratio over the years makes it crystal clear regarding the increased strength in the financial structure of the farm business. This ratio has a direct bearing on the type of assets one has. Managerial competence of the farmer is an essential element in raising the productivity of the assets.

3.6 Summary

In this unit, you have learnt how to prepare the net worth statement, estimate the test ratios and interpret the test ratios.

You have also learnt that the balance sheet indicates an account of total assets and total liabilities of the farm business revealing the financial solvency of the business.

- Assets are those which are owned by the farmer. These refer to all things which are owed to others by the farmer.
- Assets are of three types, viz. current, intermediate or working and long-term or fixed.
- This classification of assets facilitates the analysis of liquidity of the farm business.

- Liabilities are classified as current liabilities, intermediate liabilities and long-term liabilities according to the duration of loan repayment.
- The various test ratios derivable from the balance sheet are current ratio, working or intermediate ratio, net capital ratio, acid test or quick ratio, current liability ratio and equity-value ratio. These ratios indicate the liquidity positions of the farmer and capacity to meet immediate, medium and long-term financial obligations.

3.7 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

3.8 Possible Answers to Self-Assessment Exercise(s)

1.

Liabilities: These refer to all things which are owed to others by the farmer. Assets are of three types, viz. current, intermediate or working and long-term or fixed. So also, are the liabilities.

Current assets: They are very liquid or short-term assets. They can be converted into cash, within a short time, usually one year. For example, cash on hand, agricultural produce ready for disposal, i.e., stocks of yam, maize, millet, etc.

2. **Net capital ratio and acid test ratio:**

$$\text{Net capital ratio} = \frac{\text{Total assets}}{\text{Total liabilities}}$$

It indicates the long-term liquidity position of the farmers. If the net capital ratio is more than one, the funds of institutional agencies are safe. A consistently increasing ratio over the years reveals the sound financial growth of farm business. The farmer with this record should be very prompt in repayment of all types of credit obligations. This ratio is also the most important measure of overall solvency position of the farmer-borrowers.

iv. Acid test ratio or quick ratio =

$$\frac{\{\text{Cash receipts} + \text{accounts receivable} + \text{marketable securities} \\ (\text{bonds, shares etc. available in more than one year})\}}{\text{Total current liabilities}}$$

This reflects adequacy of cash and income surpluses to cover all current liabilities during the period of one to two years. If there is no difference in income position of a farmer within that period, current ratio and acid test ratio reflect the same position.

Unit 4 Income Statement

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Income Statement or Profit and Loss Statement
- 4.4 Financial Test Ratios
- 4.5 Management Ratios
- 4.6 Summary
- 4.7 References/Further Readings/Web Resources
- 4.8 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

In the last unit, you learnt about the net worth statement. The other side of the coin in farm planning is the net income statement. This unit focuses on the net income statement.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- determine net farm income
- determine financial test ratios and what they mean to the farmer
- determine management ratios.

4.3 Income Statement or Profit and Loss Statement

This is entirely different from a balance sheet in the sense that in a balance sheet, we consider assets and liabilities and do not consider operational efficiency in terms of receipts and expenses. In income statement, the items included are receipts, expenses, gains and losses. It could be defined as a summary of receipts and gains minus expenses and losses during a specified period. It is prepared for the entire farm for one agricultural year. In income statement, monetary values are assigned to inputs and outputs. It is also prepared over time. The advantages of this statement are that it indicates the trend in various cost items and whether there has been any over expenditure on the farm. Thus, it helps to know the success or failure of a business farm over time. Income statement basically constitutes three items, viz., receipts, expenses and net income. Income statement of a hypothetical farm is presented in Table 4.1.

Receipts: They mean the returns obtained from the sale of crops produce and other supplementary products like milk and eggs, wages, gifts, etc.

Gain in the form of appreciation in the value of assets is also included in the receipts. However, returns from the sale of capital assets, such as livestock, machinery, farm buildings, etc. are not included because such returns/income are not really obtained during the period.

Expenses: Operating and fixed costs are recorded here. Losses in the form of depreciation on the asset value fall under the expenditure item. However, the amounts incurred on the purchase of capital assets are not considered.

Net income: It constitutes net cash income, net operating income and net farm income.

Net cash income: It gives the position of cash receipts minus cash expenses only during the period for which income statement is prepared.

Net operating income: It is arrived at by deducting operating expenses from the gross income. Fixed costs are not given any consideration. Operating expenses include crop loans.

Net farm income: Net farm income equals net operating income less fixed costs. Compared to net cash income and net operating income, it is relatively a better measure of assessing the performance of a farm. It is the return which accrued to owned capital and family labour employed.

Income statement prepared for a given farm for a given year may present a very bright picture of the farm. The same position cannot be taken for granted as the actual position of the farm, since the said year might have been a good agricultural year with respect to weather, yields, prices, etc. A realistic position on the performance of a farm can be gauged by preparing income statements over years to show the actual situation, as the parameters influencing farm business are subject to fluctuations.

Self-Assessment Exercises

1. How does net operating income differ from net farm income?
2. What is management ratio?

4.4 Financial Test Ratios

The performance of farm business as indicated in Table 4.1 can be assessed through the income analysis by gainfully using two important parameters, viz., costs and returns. Still, some additional information is left untouched if we do not regard financial test ratios, as they

supplement new information. These help the farmers themselves as well as lending institutions, and help in developing standard norms. Two sets of income ratios can be developed. One is directly from the income and expenditure pattern, and another by taking one component from income statement i.e., income levels and comparing against capital investment made on the farm business. The former ratios are called expenses income ratios and the latter, investment-income ratios.

Table 4.1: Income Statement of a Hypothetical Farm

Particulars	Amount (in ₹)
I. Receipts	
A. Returns from the sale of crop output (paddy + pulses)	52,000
B. Revenue from milk and milk products	5,000
<hr/>	
Returns from poultry enterprises	12,000
Returns from supplementary enterprises	17,000
C. Gifts	2,000
D. Gross cash income	7,000
E. Appreciation on the value of assets	3,000
F. Gross income	74,000
II. Expenses	
<i>Operating expenses or costs</i>	10,500
A. Hired human labour	900
B. Bullock labour	1,500
C. Machine labour	1,100
D. Seeds	5,000
E. Feeds	3,000
F. Manures and fertilisers	1,550
G. Plant protection measures	500
H. Veterinary aid	250
I. Irrigation	2,000
J. Miscellaneous	2,100
K. Interest on working capital	28,400
<i>Total operating expenses</i>	<hr/> 28,400 <hr/>

<i>Fixed expenses or costs</i>		
A.	Depreciation	3,000
B.	Land revenue	200
C.	Interest on fixed capital (includes interest of ₦1500 paid towards term loan)	3,200
D.	Rental value of owed land	<u>10,000</u>
	<i>Total fixed costs</i>	<u>16,400</u>

III. Net cash income 71,000 – 28,400 = 42,600

IV. Net operating income 74,000 – 28,400 = 45,600

V. Net farm income 45,600 – 16,400 = 29,200

The following are the ratios which can be obtained directly from the income statement.

$$\text{Operating ratio} = \frac{\text{Total operating expenses}}{\text{Gross income}}$$

$$= \frac{28,400}{74,000} = 0.38$$

As the very name reveals, the ratio explains the relationship of operating costs to gross income. This ratio underlines the magnitude of working expenditure incurred for each naira of gross income. This is a direct ratio which works out to 0.38.

$$\begin{aligned} \text{Fixed ratio} &= \frac{\text{Fixed expenses}}{\text{Gross income}} \\ &= \frac{16,400}{74,000} = 0.22 \end{aligned}$$

This ratio indicates the relationship between fixed expenses and gross income. This particular ratio is 0.22. It depicts the amount of fixed expenses incurred to realise a naira of gross income. This is an indirect ratio, since fixed costs are indirect costs.

$$\text{Gross ratio} = \frac{\text{Total expenses}}{\text{Gross income}}$$

$$= \frac{44,800}{74,000} = 0.61$$

This is the ratio which is obtained when both operating expenses and fixed expenses are totalled up and compared with gross income. This can be called input-output ratio, which amounted to 0.61. All these ratios should be less than one to indicate the profitable run of the farm business. When these ratios are estimated over a period of time, a healthy trend of farm business is reflected by the descending ratios.

Investment-Income Ratios: The following two are the ratios which fall under this category.

$$\begin{aligned} \text{Capital turnover ratio} &= \frac{\text{Gross income}}{\text{Average capital investment}} \\ &= \frac{74,000}{300,000} = 0.25 \end{aligned}$$

This is also a self-explanatory ratio as explained earlier. Here, average capital investment is arrived at by adding the value of assets at the beginning of the agricultural year and at the end of the agricultural year and then averaging the two values. Suppose it is ₦300,000, then the capital turnover ratio is 0.25. This ratio gives the gross income obtained for each naira of capital invested over the year.

$$\begin{aligned} \text{Rate of return on investment} &= \frac{\text{Net return to capital}}{\text{Average capital investment}} \\ &= \frac{27,800}{300,000} = 0.09 \end{aligned}$$

Net return to capital is obtained by adding bank interest paid (interest on borrowed funds + interest paid on term loans) to the net livestock operations and management.

Net farm income (in ₦)	=	29,200
Interest paid during the year (in ₦)	=	<u>+3,600</u>
	=	<u>32,800</u>
Unpaid family labour wages (in ₦)	=	<u>-5,000</u>
Net return to total capital (in ₦)	=	<u>27,800</u>

This ratio (0.09) gives the net return on capital for every naira of average capital invested. The above two ratios relate to the income generating capacity of the investment and are hence called income investment ratios.

4.5 Management Ratios

These ratios also measure the productivity of the farm business. They are derived not from the data available in income statement, but from related information. They are, management return, crop yields and value, livestock income, gross income per man and gross income per naira investment.

- (i) **Management return:** It is derived by deducting unpaid family labour wages and interest on owned capital from net farm income.

Net farm income (₦)	=	29,200
Unpaid family labour wages (₦)	=	-5,000
Interest on owned capital (₦)	=	- 900

Management return (in ₦) = 23,300

Better assessment of the performance of the farm can be made by comparing management return for several years.

- (ii) **Crop yields and value:** This is worked out by comparing the yields obtained by the farmers for different crops with those of average yields of the area. So also, value received can be compared. Here too, the data should be available over time for appraising the ability of the farm financial manager.
- (iii) **Livestock income:** Since livestock income forms part of the income obtained on the business farm, the efficiency of livestock management can be obtained by comparing the feed expenditure against livestock income. These figures should be available over time for knowing the efficiency parameter of the livestock enterprise.
- (iv) **Gross income per man:** It is simply, knowing the labour efficiency by taking into account the number of labourers employed. This depends upon several factors like nature of crops, i.e., cereals, fibre crops, oilseed crops, etc., and the other complementary and competitive factor to human labour like machinery. However, in a homogeneous area there should be stability in this measure over time.
- (v) **Gross income per naira investment:** This is simply an input output ratio. A progressively higher ratio over the years reflects a better run of the business.

4.6 Summary

This unit discussed how to determine net farm income, financial test ratios and management ratios and what they mean to the farmer.

In this unit, you have learnt that:

- Income statement is defined as a summary of receipts and gains minus expenses and losses during a specified period and it is usually prepared for the entire farm for one agricultural year
- *Receipts* are the returns obtained from the sale of crops produce and other supplementary products like milk and eggs, wages, gifts, etc.
- *Expenses* are the operating and fixed costs are recorded here. Losses in the form of depreciation on the asset value fall under the expenditure item.
- *Net income* constitutes net cash income, net operating income and net farm income
- *Net cash income* gives the position of cash receipts minus cash expenses only during the period for which income statement is prepared

- *Net operating income* is arrived at by deducting operating expenses from the gross income.
- *Net farm income* equals net operating income less fixed costs.
- Financial ratios include operating ratio, fixed ratio, gross ratio, capital turnover ratio and rate of return on investment.
- Other ratios which measure productivity of the farm business are called include management ratios. These include management return, crop yield and value of crop yields, livestock income, gross income per man and gross income per naira invested.

4.7 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

4.8 Possible Answers to Self-Assessment Exercise(s)

1.

Net operating income: It is arrived at by deducting operating expenses from the gross income. Fixed costs are not given any consideration. Operating expenses include crop loans.

Net farm income: Net farm income equals net operating income less fixed costs. Compared to net cash income and net operating income, it is relatively a better measure of assessing the performance of a farm. It is the return which accrued to owned capital and family labour employed.

2. Management Ratios:

These ratios measure the productivity of the farm business. They are derived not from the data available in income statement, but from related information. They are, management return, crop yields and value, livestock income, gross income per man and gross income per naira investment.

MODULE 6 ECONOMIC FINANCIAL TOOLS

Unit 1	Cash Flow
Unit 2	Compounding
Unit 3	Discounting
Unit 4	Capital Budgeting

Unit 1 Cash Flow

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Cash Flow Statement
 - 1.3.1 Advantages of Cash Flow Budget
- 1.4 Break-Even Analysis
- 1.5 Margin of Safety
- 1.6 Summary
- 1.7 References/Further Readings/Web Resources
- 1.8 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

In the last unit, you learnt about the net income statement which is the other side of the coin of the net worth statement in farm planning. While the net worth statement is a stock concept, the net income statement is a flow concept. The net income statement gives the flow of expenditure and income within a time period. In addition to the net worth and income statements, it is necessary to know how cash flows in and out of the business. This is provided by the cash flow which is the focus of this unit.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- construct cash flows
- carry out break-even analysis
- determine margin of safety.

1.3 Cash Flow Statement

This is also known as cash flow summary or cash flow budget or flow of funds statement. Earlier, we have discussed about balance sheet and

income statement. These two financial management tools have inherent weaknesses in presenting certain valuable information; hence another tool in the form of cash flow statement bridges these deficiencies. Cash flow statement is a summary of cash inflows and cash outflows of a business organisation in a particular period, say a season or a year. It is usually prepared for the future, hence the name cash flow budget. The merit of this particular statement is that, it helps to assess the time at which the funds are required for farming and other allied enterprises, sources from which these can be raised, the purpose for which the loan is required, the need of sale and purchase of capital assets, the time and quantum of repayment, etc. Now, let us see why a farmer borrows funds from a particular source or sources; why he resorts to transactions like selling of farm products and livestock products and selling or buying capital assets. The answers to these questions are that the small and marginal farmers have poor resource base, and therefore, borrowings aid them in continuing the farm business. Large farmers do borrow for farm operations depending upon the need and time during which they cannot properly recycle the funds. Farmers resort to sale of farm assets like milk, cattle, machinery, etc., because they might have become worn out, for which replacements are to be made through purchases.

Cash flow statement is prepared at the beginning of the agricultural year and checked quarterly. For convenience, quarterly checks are made. The statement prepared over the years serves the purpose of studying the pattern of expenditure and cash receipts and cash balance that have been raised. A close scrutiny of the statement throws light on the performance of the business.

The example provided in Table 1.1 is briefed hereunder:

i. **Cash Receipts**

- (a) **Cash balance:** This is the surplus amount of previous year with the farmer which stood at ₦3,000.
- (b) **Total operating sales:** These are the returns obtained from the sale of farm products and livestock products. Lesser amounts are discernible in the first and second quarters, while the returns to be obtained in the third and fourth quarters are on the higher side. The farmer is sure of getting returns from milk for about 250 days in a year which is more or less uniform in the first three quarters. The returns from crop production will be received in the third quarter for maize and the returns from dry season crops obtained in the last quarter. The total operating sales amount to ₦40,750 at the end of the year.
- (c) **Total capital sale:** The farmer is contemplating to sell some animals which he possesses, in the second quarter and the amount to be received will be ₦5,000.

- (d) **Non-farm income:** It is the income which will be added by the family members by their earnings elsewhere.
- (e) **Borrowings:** The farmer wishes to borrow an amount of ₦7,500 for crop operations in the wet season.
- (f) **Total:** It is the summation of particulars of 1 to 5 rows which presents the total cash receipts to be obtained in the year.

ii. **Cash Expenses**

- (a) **Operating expenses:** These include the expenditure to be incurred on the wet season as well as dry season crops and dairy cattle.
- (b) **Capital investment:** Since the farmer proposes to dispose the dairy cattle in second quarter, he wants to buy a new one in lactation in the third quarter.
- (c) **Family living expenses:** These include expenditures towards food, medical, education and other items.
- (d) **Payment of previous year's debts:** A hand-loan of ₦500 is due to be paid in first quarter.
- (e) **Payment of short-term (ST) loans and instalments on investment loans:** Since the farmer is proposing to take a crop loan, the repayment of same falls due in the third quarter. Along with the interest and instalments, the amount due to be paid would be ₦7,968.

iii. **Cash Balance**

It is the sum of amount to be realised after deducting expenditure from cash receipts. Except for the second quarter, the farmer is expected to have a surplus in the remaining three quarters. The deficit of ₦1,650 in the second quarter can easily be cleared off from the savings of previous quarter, i.e. first quarter. Overall, the net surplus would be ₦12,332.

1.3.1 Advantages of Cash Flow Budget

Cash flow budget is a summary of all the financial matters of the farmer in a comprehensive report. This helps (i) to estimate the total credit needs (short-term, medium-term and long-term) of the farmer along with time and quantum; (ii) to plan the repayment schedule, (iii) in making purchases and sales at the appropriate time thereby helping to minimise the credit dependence; (iv) to keep ready input requirements well in advance so that last minute rush can be avoided; (v) to know the farm household expenditure pattern, so that the farmers can keep limits to avoid wastage; (vi) the farmer to exercise a check on farm costs, (vii) the farmer in preparing the farm business plans for the ensuing years, (viii) the banker for revising the scales of finance, rescheduling loans, etc., and (ix) finally, as a tool of financial control to the farmer.

1.4 Break-Even Analysis

The point at which the two curves, i.e., total cost curve and total revenue curve intersect is called the break-even point (BEP) which indicates the level of production at which the producer neither loses money nor makes a profit. In other words, the quantity at which all costs allocated to a product are equal to all revenues from its sale is known as breakeven point. At quantities smaller than the break-even point, there is a loss and at larger quantities there is a profit. There are two approaches in break-even analysis. One is called **linear**, when the selling price of a product remains constant and the other **curvilinear**, in which we come across changes in revenue owing to the changes in selling price. The second approach has applications with respect to perennial crops.

Table 1.1: Cash Flow Statement of a Hypothetical Farm

S/No	Particulars	I quarter (Mar-May)	II quarter (Jun-Aug)	III quarter (Sept-Nov)	IV quarter (Dec-Feb)	Total
I.	Cash receipts (in ₦)					
1.	Cash balance (brought from previous year)	3,000	-	-	-	3,000
2.	Total operating sales (farm and livestock products)	1,350	1,400	30,200	7,800	40,750
3.	Total capital sales (milk cattle)	-	5,000	-	-	5,000
4.	Non-farm income (family members working elsewhere)	2,000	1,500	2,000	3,200	8,700
5.	Borrowing (ST, MT and LT loans from institutional agencies)	7,500	-	-	-	7,500
	Total	13,850	7,900	32,200	11,000	64,950
II	Cash expenses (₦)					
1.	Operating expenses	8,500	6,750	6,200	5,300	26,750
2.	Capital investment (purchase of cattle)	-	-	6,000	-	6,000
3.	Family living expenses	2,400	2,800	3,200	3,000	11,400
4.	Payment of previous year's debt	500	-	-	-	500
5.	Payment of ST loans and installments on investment loans	-	-	7,968	-	7,968
	Total	11,400	9,550	23,368	8,300	52,618
III	Cash balance (₦)	2,450	-1,650	8,832	2,700	12,332

ST= short term MT= Medium term LT=long term

a. Linear Approach

Here, the total cost curve as well as total revenue curve is linear. The total revenue curve is a straight line, since the price is supposed to be constant at all quantities of output sales. The point at which the two curves intersect is the break-even point (B) as indicated in Figure 1.1.

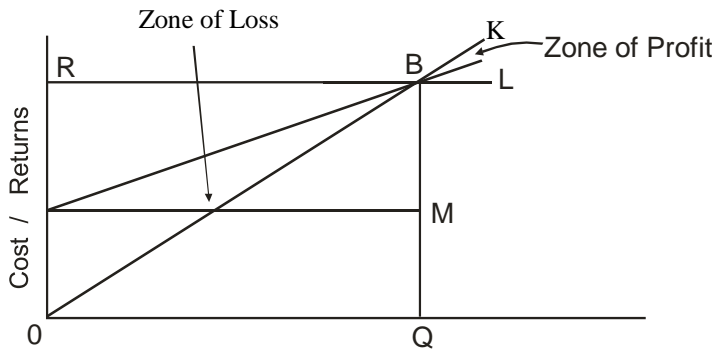


Figure 1.1: A linear break-even diagram

- OK = Total cost curve
- SL = Total revenue curve
- B = Break-even point
- OQ = Break-even quantity
- OR = Break-even money sales or revenue
- SM = Total fixed cost curve

b. Curvilinear Approach

Here, the total cost curve, SL is a straight line and the revenue curve, RK having curvature which is concave downwards, are shown in Figure 1.2. In this situation, we notice two break-even points, viz., B₁ and B₂, the former for a relatively high price and the latter for a relatively low price. In this type of analysis, it is not the break-even point which the farm financial-manager is interested, but the optimum price (maximum price) which brings in the maximum net profit.

This measure can be identified by the vertical distance at which point the two curves are farthest apart. It is obtained at the point where the two curves are parallel to each other. P is the maximum price which the farmer is interested in, at which point the total quantity sold is OQ and the revenue OR. The break-even output can be calculated with the following algebraic method.

Algebraic method: Computation of BEP in units for hypothetical small farms of maize crop.

$$BEP = \frac{F}{P - V}$$

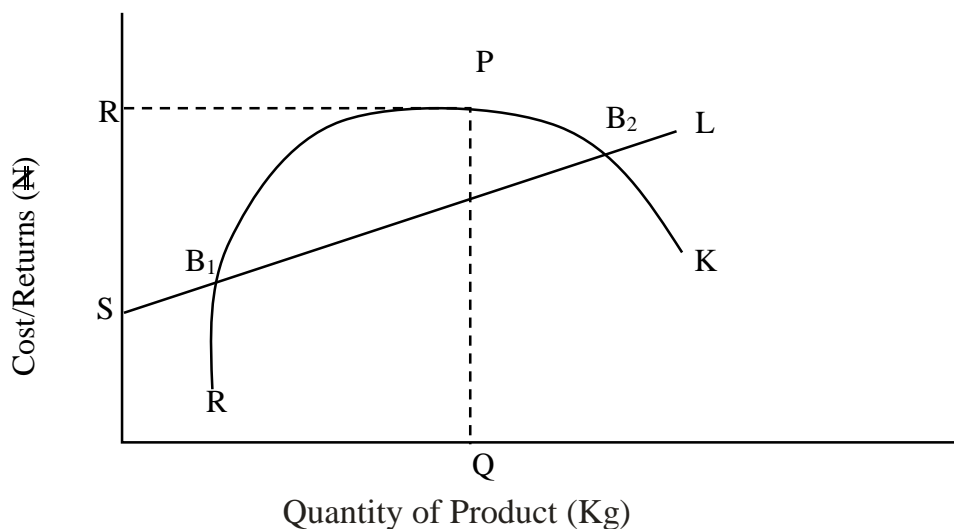


Figure 1.2: Curvilinear break-even diagram

Where:

F = Fixed costs in N per hectare of maize crop

P = Price per kg of maize in naira

V = Variable costs per ha of maize in ₦

$$BEP = \frac{8,000}{(950-485)} = 17.20 \text{ kg}$$

For further information see Table 1.2.

Computation of BEP in monetary value

$$BEP = \frac{F}{P - V}$$

$$BEP = \frac{F}{\left(1 - \frac{V}{P}\right)}$$

$$BEP = \frac{8,000}{\left(1 - \frac{485}{950}\right)}$$

$$= \frac{8,000}{0.49} = \text{₦}16,326.53$$

The break-even analysis will also facilitate in computation of certain measures, viz. margin of safety and percentage of margin of safety which help in the decision-making.

Table 1.2: Break-even output in maize cultivation

Size of farm	Fixed costs (₦)	Variable costs (₦)	Total costs (₦)	Price per (kg) (₦)	Volume of output (kg)	Total revenue (₦)	Variable costs/unit (₦)	Break-even output (kg)	Break-even point in monetary value (₦)
Small	8,000	19,400	27,400	950	40	38,000	485.00	17.20	16,326.53
Large	7,700	19,350	27,500	950	37	35,150	522.97	18.03	17,126.33

Self-Assessment Exercises

1. Enumerate the importance of a cash flow statement?
2. What is margin of safety?

1.5 Margin of Safety

It indicates the difference between total output and output at BEP or total revenue obtained from the enterprise and revenue at BEP. The positive figure of this indicator reveals the shock-absorbing capacity of the enterprise in the event of fluctuation in returns against anticipation owing to any unforeseen eventuality.

$$\begin{aligned}\text{Margin of safety (in units)} &= \text{Total output} - \text{output at BEP} \\ &= 40 - 17.20 \\ &= 22.8 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{Margin of safety} &= \text{Total revenue} - \text{Revenue at BEP} \\ &= 38,000 - 16,326.53 \\ &= \text{N}21,673.47\end{aligned}$$

$$\text{Percentage of margin of safety} = \frac{\text{BEP output}}{\text{Volume of output}} \times 100$$

$$= \frac{17.20}{40} \times 100 = 43\%$$

OR

$$= \frac{\text{BEP in monetary value output}}{\text{Total revenue}} \times 100$$

$$= \frac{16,323.56}{38,000} \times 100 = 42.96\% = 43\%$$

Similarly, we can also find out BEP for large farms.

1.6 Summary

You have learnt how to construct cash flows, carry out break-even analysis and determine margin of safety.

In this unit, you have learnt that:

- Cash flow statement is a summary of cash inflows and cash outflows of a business organisation in a particular period, say a season or a year. It is prepared at the beginning of the agricultural year and checked quarterly.

- Cash flow statement is useful for estimating the total credit needs (short term, medium term and long term) of the farmer along with time and quantum and to plan the repayment schedule.
- The break-even point is the quantity at which all costs allocated to a product are equal to all revenues from its sale is known as break-even point.
- The two approaches in break-even analysis are the linear, when the selling price of a product remains constant and the curvilinear, in which changes occur in revenue owing to the changes in selling price
- Margin of safety indicates the difference between total output and output at break-even point (BEP) or total revenue obtained from the enterprise and revenue at BEP. A positive figure of this indicator reveals the shock-absorbing capacity of the enterprise in the event of fluctuation in returns against anticipation owing to any unforeseen eventuality.

1.7 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press, Ames.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

1.8 Possible Answers to Self-Assessment Exercise(s)

1.

This helps (i) to estimate the total credit needs (ST, MT and LT) of the farmer along with time and quantum; (ii) to plan the repayment schedule, (iii) in making purchases and sales at the appropriate time thereby helping to minimize the credit dependence; (iv) to keep ready input requirements well in advance so that last minute rush can be avoided; (v) to know the farm household expenditure pattern, so that the farmers can keep limits to avoid wastage; (vi) the farmer to exercise a check on farm costs, (vii) the farmer in preparing the farm business plans for the ensuing years, (viii) the banker for revising the scales of finance, rescheduling loans, etc., and (ix) finally, as a tool of financial control to the farmer.

2. Margin of Safety:

It indicates the difference between total output and output at BEP or total revenue obtained from the enterprise and revenue at BEP. The positive figure of this indicator reveals the shock-absorbing capacity of the enterprise in the event of fluctuation in returns against anticipation owing to any unforeseen eventuality.

Unit 2 Compounding

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Compounding
 - 2.3.1 Calculating Amount Receivable
 - 2.3.2 Calculating Amount of Years
 - 2.3.3 Calculation of Interest Rate for a Sum of Money to Increase to a Given Amount
 - 2.3.4 Calculating Principal that will Amount to a Certain Sum
- 2.4 Summary
- 2.5 References/Further Readings/Web Resources
- 2.6 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

The farmer needs to know how to predict the future of a present value of money. This is what this unit is all about.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- predict the future value of a present sum of money.

2.3 Compounding

Compounding is the process of predicting the future of a present value of money. That is, what will be the future value of a sum of money say ₦10,000.00 in five years' time if the interest rate is 10%? The general formula usually used for compounding a sum of money is given as:

$$A = P(1 + r)^n$$

Where:

A = amount receivable

P = principal

n = number of years

r = rate of interest

2.3.1 Calculating Amount Receivable

Example 1

What will be the amount receivable if a farmer invested ₦10,000.00 on a farm implement for 5 years at 10% compound interest?

Principal = ₦10,000.00

$n = 5$ years

$r = 10\%$ or 0.1

$$\begin{aligned} \therefore \text{Amount} = A &= P(1 + r)^n \\ &= ₦10,000(1 + 0.1)^5 \\ &= ₦10,000(1.1)^5 \\ &= ₦10,000(1.611) \\ &= ₦16,110.00 \end{aligned}$$

This means that ₦10,000.00 today will amount to ₦16,110.00 in 5 years at 10% compound interest.

Example 2

What is the amount receivable if a farmer invested ₦20,000.00 on a Sheller for 5 years at 10% compound interest?

Solution:

Given the formula

$$A = P(1 + r)^n$$

Where $P = ₦20,000.00$

$n = 5$ years

$r = 10\%$

$$\begin{aligned} \therefore \text{Amount} = A &= ₦20,000(1 + 0.1)^5 = 20,000(1.1)^5 \\ &= ₦20,000(1.611) = ₦32,220.00 \end{aligned}$$

This means that the ₦20,000.00 invested by the farmer would have grown to ₦32,220.00 in 5 years' time.

2.3.2 Calculating Amount of Years

The number of years that it will take for a sum of money to get a given future value can be calculated as shown below:

If a farmer invests ₦40,000.00 today, how many years will it take it to grow up to ₦64,440 at 10% rate of interest?

$$A = p(1 + r)^n$$

Where:

$$A = 64,440$$

$$r = 10\%$$

$$P = 40,000.00$$

What is n ?

$$\begin{aligned} A &= 64,000 = 40,000(1 + 0.10)^n \\ &= \frac{64,000}{40,000} = (1 + 0.1)^n = (1.1)^n \\ &= \frac{8}{5} = (1.1)^n \\ &= 1.6 = (1.01)^n \end{aligned}$$

In order to determine n , two methods can be used.

- i) Trial method:
Ask this question: How many times will 1.1 be multiplied by itself to make the product 1.6?
It is done this way:
2nd year: $(1.1)^2 = 1.1 \times 1.1 = 1.21$
3rd year: $(1.1)^3 = 1.1 \times 1.1 \times 1.1 = 1.331$
4th year: $(1.1)^4 = 1.1 \times 1.1 \times 1.1 \times 1.1 = 1.464$
5th year: $(1.1)^5 = 1.1 \times 1.1 \times 1.1 \times 1.1 \times 1.1 = 1.61$
The value of 1.6 is obtained in the fifth year of the project.
 $\therefore n = 5$
- ii) Using the compound interest table (Table 2.1):
Since $1.6 = (1.1)^n$ and $r = 10\%$, look at the 10 % column and pick the number of years that equates 1.6 from the first column (the years column). The closest figure is 1.611 when column 1 reads 5. Therefore $n = 5$.

Self-Assessment Exercises

1. Given $A = P(1 + r)^n$, describe the parameters.
2. In order to determine n , two methods can be used, explain.

2.3.3 Calculation of Interest Rate for a Sum of Money to Increase to a Given Amount

At what rate of interest will ₦10,000.00 take to become ₦16,110.00, if the number of years for investment were 5 years?

Solution

Given the formula

$$A = P(1 + r)^n$$

Where $A = \text{₦}16,110.00$

$$P = \text{₦}10,000.00$$

$$r = 5 \text{ years}$$

i.) Method 1:

$$\frac{A}{P} = (1 + r)^n \therefore \left(\frac{A}{P}\right)^{\frac{1}{n}} = 1 + r$$

$$\therefore r = \left(\frac{A}{P}\right)^{\frac{1}{n}} - 1$$

$$\left(\frac{A}{P}\right) = 16110/10000 = 1.611$$

$$r = (1.6110)^{\frac{1}{5}} - 1$$

$$r = (1.1000669 - 1) \times 100\% = 10\%$$

ii) Second method is to use the compound table:

Since $\frac{A}{P} = (1 + r)^n = 16110/10000 = 1.611 = (1+r)^5$. Pick the row for 5 years and trace it to the column where the value of 1.611 is located. This happens when $r=10\%$.

$$\therefore r = 10\%$$

2.3.4 Calculating Principal that will Amount to a Certain Sum

What is the principal that will amount to ₦32,220.00 in 5 years at 10%?

Given the formula:

$$A = P(1 + r)^n$$

Where $A = \text{₦}32,220$

$$n = 5 \text{ years}$$

$$r = 10\%$$

$$\therefore P = \frac{A}{(1+0.1)^5}$$

$$P = \frac{\text{₦}32,200}{(1.1)^5}$$

$$P = \frac{\text{₦}32,200}{1.611}$$

$$P = \text{₦}20,000.00$$

Due to the tedious nature involved in the calculation of compound interest, compound interest tables have been prepared. In the table, the first column bears the years (from 1 – 20) while the other columns bear different percentages (from 3% to 15%). Checking is done by tracing the row that bears the number of years required and matching it with the percentage required. The value is then used to multiply the principal. This is shown in Table 2.1.

For a certain amount of principal of ₦50,000.00 to be compounded at 10% interest rate for 10 years in Table 2.1 we look for 10 in the ‘years’ column and match it with 10 under 10% rate of interest column. The corresponding value is 2.594. This is multiplied by ₦50,000.00 to get ₦129,700.00. This means that ₦50,000.00 compounded at 10% for 10 years will amount to ₦129,700.00.

Table 2.1: Sum of One at Compound Interest

Years	3%	5%	10%	12%	15%
1	1.030	1.050	1.100	1.120	1.151
2	1.061	1.102	1.210	1.254	1.322
3	1.093	1.158	1.331	1.405	1.521
4	1.126	1.216	1.464	1.574	1.749
5	1.159	1.276	1.611	1.762	2.011
6	1.194	1.340	1.772	1.974	2.313
7	1.230	1.407	1.949	2.211	2.660
8	1.267	1.477	2.144	2.476	3.059
9	1.305	1.551	2.358	2.773	3.518
10	1.344	1.629	2.594	3.106	4.076
15	1.558	2.079	4.177	5.474	8.137
20	1.806	2.653	6.728	9.646	16.367

2.4 Summary

In this unit, you have learnt:

- that compounding is the process of predicting the future of a present value of money.
- how to calculate amount receivable on an amount invested at compound interest.
- how to calculate amount of interest rate for a sum of money to increase to a given amount.
- how to calculate the principal that will amount to a certain sum.

2.5 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

2.6 Possible Answers to Self-Assessment Exercise(s)

1.

A = amount receivable

P = principal

n = number of years

r = rate of interest

2. To determine n, two methods can be used:

a. Trial method:

Ask this question: How many times will 1 be multiplied by itself to make the product?

b. Using the compound interest table.

Unit 3 Discounting

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Discounting
 - 3.3.1 Calculating Present Worth
 - 3.3.2 Using the Discount Table
- 3.4 Summary
- 3.5 References/Further Readings/Web Resources
- 3.6 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

The farmer needs to know the present value of a future sum of money. This is what this unit is all about.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- determine the present worth of some future sum of money.

3.3 Discounting

Discounting is the process of finding the present worth of a future value of money. It is exactly the reverse of the process of calculating compound growth. While compound interest shows growth in the value of money over time, discount shows how the value of a sum of money decreases. In short, discounting is used to determine the real cost of loan. When loans are discounted, it means that the amount of interest to be paid is deducted from the sum of capital at the time it is borrowed.

3.3.1 Calculating Present Worth

For example, what is the present worth of money that will equal ₦100,000.00 in 5 years at 10%?

$$\text{Present value (PV)} = \frac{A}{(1+r)^n}$$

Where:

PV = present value

A = future value r = rate of interest n = number of years

$$\text{PV} = 100,000 / (1.1)^5 = \text{₦}62,073.25$$

This means that the present value of ₦100,000.00 in 5 years today at 10% interest rate is ₦62,073.25.

Example 2

Suppose a farmer purchased a farm tool to pay back ₦32,220.00 in 5 years at the compound interest of 10%. What is the worth of equipment today?

$$\text{Present value (PV)} = \frac{A}{(1+r)^n}$$

Where A = ₦32,220.00

r = 10%

n = 5 years

$$\begin{aligned} \therefore \text{PV} &= 32,220 / (1 + 0.1)^5 \\ &= \text{N}32,220 / 1.611 \\ &= \text{N}20,000.00 \end{aligned}$$

Self-Assessment Exercises

1. What is discounting?
2. State the formula for calculating present worth and interpret the parameters.

3.3.2 Using the Discount Table

To avoid tedious calculations, a discount table has been prepared (Table 3.1). With the table, one can easily trace the number of years required with the percentage. The value which is usually less than 1 is then used to multiply the future value of money.

Example

Using the table below, what is the present value of money that will be ₦250,000.00 in 8 years at 12% interest rate? The figure corresponding to the number 8 in the years' column (column 1) traced to 12% interest rate is 0.404. The present value is therefore given by

$$\text{PV} = 250,000 / 0.404 = \text{N}618, 811.88$$

Table 3.1: Discount Factor for Each Project Year

Projected period (years)	Present value of one				
	5%	8%	10%	12%	15%
1	.952	.926	.909	.893	.870
2	.907	.857	.826	.797	.756
3	.864	.794	.751	.712	.658
4	.823	.735	.683	.636	.572
5	.784	.681	.621	.567	.497
6	.746	.630	.564	.507	.432
7	.711	.583	.513	.452	.376
8	.677	.540	.467	.404	.327
9	.645	.500	.424	.361	.284
10	.614	.463	.386	.322	.247
15	.481	.315	.239	.183	.123
20	.377	.215	.149	.104	.061

3.4 Summary

In this unit, you have learnt:

- that discounting is the process of finding the present worth of a future value of money.
- how to calculate present worth.
- how to use the discount table.

3.5 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

3.6 Possible Answers to Self-Assessment Exercise(s)

1.

Discounting is the process of finding the present worth of a future value of money. It is exactly the reverse of the process of calculating compound growth. While compound interest shows growth in the value of money over time, discount shows how the value of a sum of money decreases. In short, discounting is used to determine the real cost of loan.

2. Calculating Present Worth

For example, what is the present worth of money that will equal ₦100,000.00 in 5 years at 10%?

$$\text{Present value (PV)} = \frac{A}{(1+r)^n}$$

Where:

PV = present value

A = future value

r = rate of interest

n = number of years

Unit 4 Capital Budgeting

Unit Structure

- 4.1 Introduction
- 4.2 Learning Outcomes
- 4.3 Capital Budgeting
 - 4.3.1 Aims of Capital Budgeting
 - 4.3.2 Steps in Capital Budgeting
 - 4.3.3 Methods of Capital Budgeting
- 4.4 Summary
- 4.5 References/Further Readings/Web Resources
- 4.6 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

Capital resources are limited, sometimes specialised, difficult to acquire and expensive. It is therefore necessary that capital is carefully budgeted for. The unit therefore contains detailed information on capital budgeting.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define capital budgeting
- state the aims of capital budgeting
- describe the three capital budget methods namely:
 - ✓ payback period
 - ✓ present value method
 - ✓ internal rate of return.

4.3 Capital Budgeting

Capital budgeting, as its name implies, involves planning for and evaluating the expected economic returns from alternative capital investments when the returns extend for several years into the future. In its widest sense, a budget is a forecast to an account that records financial transactions as they occur. It is a plan for the future in terms of money, quantity or both. Budgeting is needed for all progressive, successful concerns - whether a farm, store or even for personal affairs - to estimate whether a proposed change is justified. All budgeting is forecasting. It means trying to state now what will occur in future. Inevitably, this is uncertain; it is better to budget intelligently than not to budget at all but simply hope for the best.

Although capital budgeting is of little interest to small farmers, it is important to larger businesses and development schemes because the commonest use of budgets is to help decide between one farming system and another or between changes in an existing system.

4.3.1 Aims of Capital Budgeting

- a. As capital resources are limited and as it takes a long while to recover the cost of investment in plant and machinery from operations thereby leading to inflexibility; capital budgeting helps to control management activities since performance can be compared with what is budgeted.
- b. Capital investments in land improvement and development, permanent buildings and expensive equipment usually have a long lifespan and expenditures on them may affect the operation and success of the business for many years to come if budgeting is not done.
- c. Because capital investments are quite specialised, difficult and expensive to adapt them to other purposes, their intended use can be proved profitable through capital budgeting.
- d. Effective budgeting reduces cost by helping to assure that the desired type and quality of equipment, machinery and building as well as the necessary financing will be available on terms more favourable than would likely be obtained without such careful planning.
- e. Since relatively large sums of money generally are involved in capital investment, mistakes are especially costly and expensive if budgeting is not done.
- f. Although much planning is still done informally, budgeting reduces the chance of any important effects being overlooked.

Many farmers have regretted making changes without budgeting; they have adopted a change and found that instead of rising, profit has dropped. A budget may be for a short time ahead or several years. Capital expenditure is often planned five to ten years in advance so that, for control purposes, it should be broken down into convenient periods like years or months. The period for which is reasonable to budget depends on the type of business, the length of the production cycle and the ease or difficulty of forecasting future market conditions. This period needs not be the same for each section of the business.

A long-term budget is often prepared as a general objective and is added to more detailed, short-term budgets. The short-term budgets are compared period by period with the long term so that the manager can see if the business is progressing as planned.

4.3.2 Steps in Capital Budgeting

Below are the major steps usually involved in capital budgeting:

- i. Estimating the capital cost of investment. This is done by careful determination of the physical specifications for all the buildings, land, machinery, equipment and the like that will be needed in the proposals and an assessment of their monetary costs.
- ii. Estimating the expected net cash inflows throughout the future time periods for the proposals. Net cash inflow is a net profit figure after all operating costs have been subtracted from total revenue, including taxes. Depreciation is considered a cost for tax purposes, but it is not a cash cost. Therefore, the depreciation subtracted for tax purposes is added back to obtain net cash flow. Developing a good net cash inflow estimate requires paying meticulous attention to details. For example, if the new investment is primarily cost - reducing, the cash inflow would include the net amount of cash savings in annual operating costs. Future production and prices must be estimated, along with all the operating costs for each year of the expected life of the project. For better estimation, the knowledge and cooperation of an agricultural economist, agronomist, agricultural engineer, animal scientist and agricultural biologist are needed.
- iii. Determination of the present or discounted value of the net cash flow at an appropriate rate of interest or cost of capital to the business. Since the cost of borrowing varies by firms, depending on their debt/equity ratio and their reputation as borrowers, if the firm is already using a large amount of debt in relation to the owner's capital, additional borrowed capital may not be available at all unless equity capital is increased. If more equity is required, then the cost of capital to the owners is his opportunity cost.
- iv. Decide on which alternative to choose based on the results of proceeding economic analysis and the judgment of the owner/manager. Even when great capital is used in making costs and returns estimates, capital budgeting results far from certain because in many instances, it is not possible to anticipate changing economic conditions. For this reason, the owner's financial situation and business judgment come into play in the final decision.
- v. Execute the best plan. Once the farmer or individual selects the best plan, it must be put into operation. He should be ready to accept responsibility for the outcome of its implementation.

The basic problem in capital budgeting arises because of the long-time horizon involved. Attempting to predict costs, prices, and output for even one year ahead is subject to considerable uncertainty. Capital budgeting requires that estimates be made for five, ten or twenty years into the future. This problem of determining the present value of a series of cash inflows or returns extending over the life of the investment can be done using the formula below:

$$PV = \left(\frac{A_1}{(1+r)^1} \right) + \left(\frac{A_2}{(1+r)^2} \right) + \left(\frac{A_3}{(1+r)^3} \right) + \dots + \left(\frac{A_n}{(1+r)^n} \right)$$

$A_1 - A_n$ = The amount in years, 1 to year n

r = rate of interest

n = number of years

PV= present value

If the amounts of future income in the above equation are equal and if they continue in perpetuity rather than for a fixed number of years, then the equation reduces to the well-known capitalisation formula:

$$V = \frac{A}{r}$$

This equation is used in land appraisal to obtain the capitalised income value of land. For example, if the future annual net income attributable to land, after the cost of all inputs including labour and management have been deducted from gross income, is estimated to be ₦200.00 per hectare in perpetuity (i.e. for all time in the future) and the interest rate is 10 percent then:

$$V = \frac{200}{0.10} = \text{₦}2,000.00 \text{ per hectare}$$

This is the capitalised value of the land per hectare. This ₦2,000.00 represents the present value or capitalised value of the ₦200.00 annual income received in perpetuity when discounted at 10 percent. It should, however, be noted that the capitalised value is not the same as market value. The price at which the ownership of land changes hand is determined by many other considerations, such as location, availability of public services and attractiveness of the community. Nevertheless, the buyer contemplating a purchase of farmland will find it worth the effort required to estimate the capitalised value before buying. This will give him some rough approximation of how much more he may be paying for other factors that determine the market value of the land beside the expected net annual income.

4.3.3 Methods of Capital Budgeting

There are three major methods involved in capital budgeting. They are:

- a) the payback period,
- b) present value method, and
- c) internal rate of return.

a. The payback period method

This method estimates the time required for the net additional cash inflow per year to equal the cost of investment. That is, if we are investing ₦100,000 each in project A and B, in how many years shall we pay back the money invested? Formula for this is:

$$P = \frac{I}{CF}$$

Where:

P = Payback period

I = Investment

CF = Net cash flow

Assuming that there are two investments A and B each of which costs ₦100,000.00 and they have the following net cash flows:

Year	Project A	Project B
1	40,000	40,000
2	30,000	25,000
3	30,000*	25,000
4	20,000	10,000*
5	10,000	10,000

For project A, the payback period would be 3 years while for project B the payback period would be 4 years. Based on the payback period, project A would be selected rather than project B. This is because it has the shorter payback period. As a matter of principle, any project that has the shortest payback period among projects would be selected because the shorter the payback period, the more profitable the project.

The payback period has two advantages, and they are:

- (1) It is simpler than other capital budgeting methods.
- (2) The payback period approach favours those proposals that promise high quick returns, which is an advantage when a business is short of cash.

b. Present value method

This method corrects the major limitations of the payback period approach because it determines the present value of the cash inflow required to make the investment. If the discounted net return exceeds the

cost of the investment, the project will be acceptable. If not, it would be rejected. The project with the highest net present value would have the highest priority for the use of available investment funds. Let us look at this example.

Let us assume that a project will require an investment fund of ₦100,000. The project would yield an uneven series of net cash inflows over 4 years period and the farm cost of capital is 9%.

Table 4.1: Present value method

Years	Net cash inflow	Discount factor at 9%	A Present value at 9%	Discount rate at 10%	B Present value at 10%
1	42,500	.917	39000	.909	38600
2	37,500	.842	31600	.826	31000
3	300,000	.772	23200	.751	22500
4	100,000	.708	7100	.683	6800
			100,900		98,900

Since at 9% the present value of the cash inflow is ₦100,900.00 and it exceeds by ₦900.00 the present cost of the capital investment of ₦100,000.00, the project would be acceptable at that rate. This is because the investment would yield more than the minimum acceptable rate of 9%. However, if the discount rate were 10%, the present value of the cash inflow would have been ₦98,900.00 which is less than the capital investment of ₦100,000.00. The project would be rejected at 10% rate. This is because the project would yield less than ₦100,000.00

c. Internal rate of returns

The net present value does not indicate what rate of return a proposed investment would be expected to yield. In the previous example, we know that at least it would yield 9%, but we do not know the exact. Internal Rate of Return method gives this additional information.

In our previous example, note that 9% came close to equating the present value of the net return (₦100,900.00) with the cost of investment (₦100,000). When we used a higher discount rate of 10%, it reduced the present value to ₦98,900.00. Thus, we know that the Internal Rate of Return lies midway between 9% and 10%. An interpolation gives us a rate of 9.45 percent value of the net inflows approximately ₦100,000, thereby equating it with the cost of investment. While it is somewhat easier to use the present value method, the internal rate of return approach provides an expected yield figure which is what the manager usually wants.

Self-Assessment Exercises

1. Outline the three methods involved in capital budgeting.
2. Mention the advantages of the payback period.

4.4 Summary

In this unit, you have learnt that:

- Capital budgeting involves planning for and evaluating the expected economic returns from alternative capital investments when the returns extend for several years into the future.
- Capital budgeting helps the farmer to:
 - ✓ control management activities since performance can be compared with what is budgeted;
 - ✓ avoid unnecessary expenditure which may affect the operation and success of the business for many years to come;
 - ✓ know whether intended use is profitable or not;
 - ✓ reduce cost by helping to assure that the desired type and quality of equipment, machinery and building as well as the necessary financing will be available on terms more favourable than would likely be obtained without such careful planning;
 - ✓ avoid expensive mistakes in practice; and
 - ✓ reduce the chance of any important effects being overlooked.
- Steps in capital budgeting, include:
 - ✓ Estimating the capital cost of investment.
 - ✓ Estimating expected net cash inflow.
 - ✓ Determination of present or discount value of net cash flow.
 - ✓ Deciding alternative to choose.
 - ✓ Executing best plan

The formula is $PV = \left(\frac{A_1}{(1+r)^1}\right) + \left(\frac{A_2}{(1+r)^2}\right) + \left(\frac{A_3}{(1+r)^3}\right) + \dots + \left(\frac{A_n}{(1+r)^n}\right)$

For asset in perpetuity: $V = \frac{A}{r}$
- The three major methods involved in capital budgeting are:
 - ✓ the payback period,
 - ✓ present value method, and
 - ✓ internal rate of return.

4.5 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*. New Delhi: Oxford & IBH Publishing Co. PVT.

4.6 Possible Answers to Self-Assessment Exercise(s)

1.

There are three major methods involved in capital budgeting. These are:

- a) the payback period,
- b) present value method, and
- c) internal rate of return.

2. Advantages of the payback period

- a. It is simpler than other capital budgeting methods.
- b. The payback period approach favours those proposals that promise high quick returns, which is an advantage when a business is short of cash.

MODULE 7 COSTS AND RISKS IN AGRICULTURAL LENDING

Unit 1	Types of Risks and Strategies to Reduce Risks
Unit 2	Problems Encountered by Government Financial Institutions
Unit 3	Agricultural Loan Delinquency and Diversion in Nigeria
Unit 4	Subsidising Agricultural Credit and Inputs in Nigeria

Unit 1 Types of Risks and Strategies to Reduce Risks

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Financial Transactional Costs
 - 1.3.1 Dispersed Clients
 - 1.3.2 Seasonality of Agricultural Production
 - 1.3.3 Heterogeneity of Farming
- 1.4 Risks Associated with Agricultural Lending
 - 1.4.1 Credit or Loan Default Risk
 - 1.4.2 Liquidity Risk
 - 1.4.3 Interest Rate Risk
 - 1.4.4 Foreign Exchange Risk
- 1.5 Risks Faced by Small Farmers
 - 1.5.1 Production and Yield Risks
 - 1.5.2 Market and Price Risks
 - 1.5.3 Risk of Loan Collateral Limitation
 - 1.5.4 Risks from Changes in Domestic and International Policies
- 1.6 Strategies to Reduce Costs and Manage Risks
 - 1.6.1 Cost Reduction
 - 1.6.2 Standardisation of Loan Products and Lending Procedure
 - 1.6.3 Productivity of Loan Officers
 - 1.6.4 Group Lending
- 1.7 Summary
- 1.8 References/Further Readings/Web Resources
- 1.9 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

Agricultural production is faced with a lot of risks and uncertainties. Lending to such risky ventures inevitably leads to high transactional costs. In this unit, we shall therefore examine risks and strategies for reducing lending risks.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain why lenders face high financial transactional costs
- describe the risks associated with agricultural lending
- describe the risks faced by small scale farmers
- describe strategies to reduce risks.

1.3 Financial Transactional Costs

Agricultural lenders face high financial transactional costs when granting loans to small farmers. This is because of the unique features of agricultural lending. Some of these features include:

- a. Long distances to serve a dispersed rural clientele.
- b. Poorly developed transportation and communication infrastructures.
- c. Expensive management and supervision of rural branch network, and
- d. High additional cost for borrowers; opportunity costs (e.g. lost working time) transport costs, legal and title fees.

Financial transactional cost of institutional credit can also be high for rural borrowers. This occurs because borrowers may have to pay several visits to the bank branch to conclude cumbersome loan application procedures which require a long time for processing. Clients often have to spend much time and money to obtain the required documents and to find loan guarantors. For small loans, these costs can significantly increase the effective lending interest rate.

1.3.1 Dispersed Clients

Low population density coupled with dispersed location of rural clients make the provision of formal financial services costly. From the lender's perspective, the long distances between communities and the inadequate rural transportation facilities in many developing countries increase the costs of loan appraisal, loan monitoring and the enforcement of loan repayment. The use of mobile loan officers or branch offices can be effective in lowering transactional costs, but mobile facilities may be subject to high risk if bank staff is required to transport the money. One of these risks is possible attack by armed robbers.

From the borrowers' perspective, the non-interest cost of acquiring formal loans can be substantial. Total borrowing costs especially for small borrowers may greatly exceed normal interest payment. These costs could be transportation cost, legal and title fees, paper work

expenses and time lost in waiting on the line. Borrower's costs may also increase when formal loans are not disbursed quickly.

1.3.2 Seasonality of Agricultural Production

The seasonality of agricultural production and the relative long gestation period before crops can be harvested and sold have direct implications for the financial transactional costs of the lenders. Normally, agricultural loans are always larger and they are required for longer periods. In addition, marching assets and liabilities are more difficult than for non-farm activities. Furthermore, agricultural credit is also often repaid in "lumpy" instalments. These are one or two loan repayments rather than regular monthly instalments that is prevalent in micro credit. This irregular pattern implies that lenders have more difficulty in monitoring repayment capacity and willingness. Moreover, an uneven distribution of agricultural lending operations over the years increases the fixed costs of personnel. Thus, the earnings from lending may not be sufficient to cover these costs.

1.3.3 Heterogeneity of Farming

As a result of the diversity in farm and non-farm income-generating activities of rural household, better knowledge of the farm household financial situation is required. Loan officers have more information in the case of urban lending than those of the farmers in the rural areas. Thus, the investigation of this information can extend the bank staff's time and costs needed for loan appraisal. It may also require the setting of individual loan repayment terms. Doing this is likely to increase the costs of training agricultural loan officers.

1.4 Risks Associated with Agricultural Lending

There are two major types of risks that are associated with agricultural lending. They are those faced by financial institutions and those faced by the small farmers.

Financial institutions face four major risks. They are:

1.4.1 Credit or Loan Default Risk

This refers to situations where borrowers are unable or willing to repay the loan principal and to service the interest rate charges.

1.4.2 Liquidity Risk

This occurs when a bank is not able to meet its cash requirements. Mismatching the term of loan assets and liabilities exposes banks to high liquidity risks.

1.4.3 Interest Rate Risk

This happens when a loan declines in value as interest rate changes or because of inflation. For example, a bank gave out loan at 20% interest rate for 5 years, but during the time inflation rose to 30%.

1.4.4 Foreign Exchange Risk

This defines exposure to changes in exchange rates which affect international borrowings designated in foreign currency.

Self-Assessment Exercises

1. Distinguish between loan default and liquidity risks.
2. How does risks from changes in domestic and international policies affect farmers?

1.5 Risks Faced by Small Farmers

1.5.1 Production and Yield Risks

Yield uncertainty could be due to natural hazards which are usually referred to as impact of weather, pests and diseases or calamities on farm production. Risks severely impact younger, less well established, but more ambitious farmers. For example, people that are mostly affected are those who embark on farming activities that may generate a high potential income at the price of concentrated risks. Subsequent loan defaults may adversely affect the credit worthiness of farmer borrowers and their ability to secure future loans.

1.5.2 Market and Price Risks

Price uncertainty due to market price fluctuation is particularly severe where information is lacking and when markets are imperfect. The relatively long period between the decision to plant a crop or to start a livestock enterprise and the realisation of farm output, means that market prices are unknown at the moment when a loan is granted. This problem is even more acute for perennial tree crops like cocoa and

coffee because of the gap of several years between planting and the first harvest.

1.5.3 Risk of Loan Collateral Limitation

Inadequate loan collateral poses specific problem to rural farmers. Land is the most widely accepted asset for use as collateral, because it is fixed and not easily destroyed. It is also often prized by owners above its market value and it has a high scarcity value in densely populated areas. Small farmers with land that has limited value are less likely to have access to bank loans. Also, movable assets, such as livestock and equipment, are regarded by lenders as higher risk forms of security. Therefore, the owner must provide proof of purchase and must have insurance coverage on these items. This is rarely the case for low-income small farmers.

There are a number of loan contract enforcement problems. For example, restriction on the transfer of land received through land reform programmes limits its value as collateral. In most developing countries, the poor have difficulties in clearly demonstrating their legal ownership of land assets. Thus, they cannot use such land assets as collaterals.

1.5.4 Risks from Changes in Domestic and International Policies

Policy changes and state interventions can have a damaging impact on both borrowers and lenders. Changes in policy can affect farmers' productivity. This can have serious effect on their income and demand for productive inputs such as fertilisers. If a change in government policy reduces public expenditure as an essential part of structural adjustment programmes, the employment of small farmers may be affected because land area that can be cultivated will be reduced.

1.6 Strategies to Reduce Costs and Manage Risks

Micro lenders have developed solutions to the problems of costs and high risks associated with lending to micro enterprises. They can be applied to reduce cost of risks in agricultural lending.

1.6.1 Cost Reduction

Macro lenders face the problem of high costs that are associated with the granting of small loans. Loan administrative costs do not vary by loan amount. That is, the administrative cost of granting ₦500.00 loan may be the same as that of granting ₦500,000.00 loan. Thus, small loans are less profitable for lenders. For this reason, many formal financial

institutions cannot open too many branches. This is so because setting up and operating branches is very costly and the profit generated may not be able to cover the operating costs. Various strategies of reducing costs are presented below:

1.6.2 Standardisation of Loan Products and Lending Procedure

Micro lenders simplify their operations by offering only a few highly standardised loan products. They usually provide short-term working capital loans and only occasionally, grant investment capital loan to established borrowers. Similarly, loans are kept small and are extended for only a few weeks or months, especially for first-time clients.

Borrowers with good loan repayment records are rewarded almost automatically with repeat loans. Some micro lenders increase the size of repeat loans by using pre-determined formulae. In addition, micro lenders usually charge small borrowers interest rates and fees that are much higher than those that are used by conventional formal lenders.

1.6.3 Productivity of Loan Officers

Loan officers are expected to serve a large number of clients. Up to 200 – 300 borrowers may be assigned per loan officer. In order to achieve this, staff performance bonuses are widely used. These incentives are related to the loan volume handled, the quality of the loan and the number of low-income clients that are attended to. While these incentives increase the loan administration costs, well trained and motivated staff is essential to increase the overall productivity of the financial institution.

1.6.4 Group Lending

Proponents of group lending approach highlight the cost-reduction aspect of this methodology. There are two modalities of group lending. A micro lender may lend to a collective entity such as a co-operative or a village bank, which in turn on-lends the funds to its members. In both cases, group members are collectively responsible for the full and timely repayment of the loans.

Group lending can have the advantage of increasing the lenders outreach capacity by reducing the loan-administrative costs. In the first kind of group lending mentioned above, only one loan is administered for each group. In addition, group lending reduces the lender's costs by maximising the use of insider information and by relying on peer borrower screening.

You have learnt about the financial transactional costs faced by agricultural lenders, what leads to financial transactional costs, the risks associated with agricultural lending, the risks faced by small scale farmers and the strategies to reduce risks.

1.7 Summary

Financial transactional costs faced by agricultural lenders, what leads to financial transactional costs, the risks associated with agricultural lending, the risks faced by small scale farmers and the strategies to reduce risks were discussed in this unit.

You have learnt that:

- Why lenders face high financial transactional costs are because of:
 - ✓ dispersed clients
 - ✓ seasonality of agricultural production
 - ✓ heterogeneity of farming.
- Risks associated with agricultural lending are:
 - ✓ credit and loan default risks
 - ✓ liquidity risks
 - ✓ interest rate risks
 - ✓ foreign exchange risks.
- Risks faced by small farmers are:
 - ✓ production and yield risks
 - ✓ market and price risks
 - ✓ risk of loan collateral limitations.
- Strategies to reduce costs and manage risks include:
 - ✓ cost reduction
 - ✓ standardisation
 - ✓ productivity of loan officers
 - ✓ group lending

1.8 References/Further Readings/Web Resources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

1.9 Possible Answers to Self-Assessment Exercise(s)

1.

Loan default risk: This refers to situations where borrowers are unable or willing to repay the loan principal and to service the interest rate charges.

Liquidity risk: This occurs when a bank is not able to meet its cash requirements. Mismatching the term of loan assets and liabilities exposes banks to high liquidity risks.

2.

Policy changes and state interventions can have a damaging impact on both borrowers and lenders. Changes in policy can affect farmers' productivity. This can have serious effect on their income and demand for productive inputs such as fertilisers. If a change in government policy reduces public expenditure as an essential part of structural adjustment programmes, the employment of small farmers may be affected because land area that can be cultivated will be reduced.

Unit 2 Problems Encountered by Government Financial Institutions

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Situations Faced by Government Lending Agencies
 - 2.3.1 High Administrative Cost
 - 2.3.2 High Default Rate
 - 2.3.3 Complicated Administrative Procedures
 - 2.3.4 Poor Coordination with other Agricultural Services
 - 2.3.5 Inadequate Supply of Loanable Funds
 - 2.3.6 Personnel Problems
 - 2.3.7 Illiteracy of the Small-Scale Farmers
 - 2.3.8 Lack of Security for Loans
 - 2.3.9 Low Interest Rate Charges on Agricultural Loan
 - 2.3.10 The High Credit Delivery Cost
- 2.4 Summary
- 2.5 References/Further Readings/Web Resources
- 2.6 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

In the previous unit, you learnt that both agricultural lenders and farmers face a lot of costs due to risks and uncertainties of agriculture. This unit will expand further on the problems that are specifically encountered by the government financial institutions in the course of fulfilling their roles.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain all the various problems encountered by the government financial institutions.

2.3 Situations Faced by Government Lending Agencies

Criticism is often levelled at government credit institutions serving agriculture in developing countries, but it is important also to consider the formidable handicaps under which they are required to function.

While it is true that some of their problems arise from the basic policies, organisation and operations of the institutions themselves, other

impediments are inherent in the economic and social conditions in which they must operate.

In the case of small farmer-borrowers especially, their resource base is severely limited, they possess little formal education and understanding of the wise use of credit. The roads and transport facilities required for bringing in necessary supplies and services and to take produce to market often range from mediocre to non-existent. Weather, price and biological risks are high and government policies may provide little income incentive. Thus, when credit institutions attempt to reach a significant number of farmers, they find themselves dealing with a very large number of individuals scattered over a geographic area. Communication is hampered and timely actions are inhibited, effective supervision cannot be easily provided. In short, most of the economic, social and political difficulties that have retarded agricultural development also hinder private and government credit institutions attempting to serve small scale farmers. Some other problems include high administrative costs, high default rate, complicated administrative procedures, poor communication with other agricultural services, inadequate supply of loanable funds, personnel, illiteracy among small scale farmers, lack of security for loans, low interest rates and high credit delivery cost. These points are discussed in subsequent sections.

2.3.1 High Administrative Cost

To be self-supporting, a credit agency must charge an interest rate on its loans high enough to permit recovery of three kinds of costs: the costs the agency incurs to obtain the funds, the loss of capital through loan defaults, and the administrative costs of operating the credit agency. Thus, if a credit agency pays six percent for the money it borrows for on-lending and loses six per cent of its capital on average each year through bad debts, and has administrative costs equal to eight percent of its loans, then it would need to charge twenty percent interest to break even. Government credit agencies in developing countries often find that loan losses and administrative costs get out of control. It therefore becomes impossible to charge borrowers interest rates sufficiently high to cover these costs, so the institution finds itself dependent upon government support to continue operations.

In practice, administrative costs are not always calculated in same manner. Sometimes only the costs of operating part of the system are considered, although it is customary to include all personnel, transport and office costs involved in the process of extending and collecting loans from farmers. But one may ask whether it is proper to include all the services a credit agency's staff may perform as a cost credit administration. For example, it has been argued that development of

farm plans and technical supervision of loan use should be counted as farmer education. Once the total administrative costs for a year are determined, they may be expressed as a percentage by dividing the sum by the value of new loans made during the year, and/or by the total loan portfolio. From the standpoint of internal management, it would seem desirable to take a comprehensive view of the costs of credit administration and, where possible, allocate the total cost among the major functions the credit institution is actually performing. Such a cost analysis would suggest areas where the administrative overhead may be excessive relative to the benefits being derived and adjustments could then be made.

2.3.2 High Default Rate

The World Bank considers reducing the high rate of delinquency and default the most important issue facing government credit programmes, attempting to operate on a self-sustaining basis. If a high proportion of an institution's loans are not repaid, the lender's capital is soon depleted and the institution must cease to function as a loan agency unless, government provides additional funds. Credit programs have been known to exist for some time on this basis, but they can hardly be considered successful in providing a long-run solution to farmers' financial needs.

Although non-repayment of loans is a serious problem, reliable data on its actual magnitude are often not available. One of the problems is the variation in definition of terms used by lending institutions in reporting data. For example, how long a period should elapse before a delinquent loan is classified as non-collectible and written off? What is the amount of arrears concealed by the refinancing of unpaid loans which may then be counted as having been repaid?

One common measure of delinquency is the percentage of an institution's loan portfolio which is overdue as of a given date. A higher ratio would certainly be a warning of possible serious trouble, but it should be noted that the ratio fails to reveal as much as could be desired about the nature of the problem. For example, short-term loans which may be delinquent for only a month or two and may soon be repaid are included on the same basis as those on which no payments on principal or interest have been received for several years and which probably are not collectible.

In Nigeria, the repayment performance was poor for rice-maize group loans made in 1972. Loans to 30 rice groups involving 390 farmers had been 75 percent repaid by June 30, 1973, but the repayment rate varied widely from 32.9 percent for rice loans in one administrative area to

90.7 percent in another. Loans to 44 maize groups were 57.2 percent repaid by the same date. In contrast, 95 percent of the loans to 32 cocoa groups were repaid by June 30, 1973. The profitability of cocoa, plus the fact that repayment could be collected at the point of sale in the case of cocoa undoubtedly were important factors in the superior repayment record.

Loan repayment is also affected by the widespread idea that government loans are in effect rewards that do not need to be repaid; unfortunately, some governments have done little to dispel this idea. As Ugoh has said, "many people look at the Government as a distant impersonal institution. They do not consider themselves as part of the Government. They look up to the Government the way many European and North American children look out for Father Christmas. They are anxious to receive their share of the "National Cake" which the Government is supposed to bake, store and distribute". Other values and beliefs of farmers/borrowers may affect repayment as Gillette and Uphoff have pointed out, "attitudes toward work and division of labour, toward time and thrift, toward credit and indebtedness, toward government in general, are all critical factors influencing the farmer's use of credit and his willingness to repay."

2.3.3 Complicated Administrative Procedures

Use of numerous forms discourages the borrower and adds to the lender's administrative cost. The high degree of centralisation slows down the lending process and leads to the common criticism that the credit arrives too late to be useful for its intended purpose. In considering this problem, Osuntogun has stated that one of the major reasons for the failure of most credit institute in Nigeria is that they have complicated, cumbersome and time-consuming procedures which result in delays in approval and in loans not being made available when required.

Based on first-hand experience, Patel has expressed concern about the tedious lending procedures the borrower goes through in terms of time, effort and money, as follows: *"Before a farmer gets a loan he has to make several trips to the divisional/circle office for different purposes such as buying application forms, submitting application forms, taking three guarantors to sign in the presence of an officer, to get photographs, to inquire two or three times whether the Cheque is ready, to collect the Cheque, to go to the bank to cash the Cheque and to withdraw cash from his account. For a small farmer located 10 to 15 kilometres from the divisional office, it is really a task making these trips and it is also quite expensive. On a small loan, these transaction costs may substantially exceed the interest charges, so the total cost of*

credit to the borrower is high even though the interest rate is comparatively low". In addition to interest payments, Adams and Nehman have identified three other types of costs borrowers may incur in obtaining, negotiating and repaying a loan. These are: additional transaction charges collected by the lender beyond the interest payments, loan transaction costs paid by the borrower to someone other than the lender and the borrower's time and other costs which result from the loan transaction. When these transaction costs are taken into account the high interest rates charged by informal lenders on small loans may be more competitive with institutional credit than is generally appreciated.

2.3.4 Poor Coordination with other Agricultural Services

Agricultural credit officials and advisers agree that providing credit alone to small farmers in developing countries is seldom beneficial. In such cases, the credit is likely to be misused, with the result that the farmer finishes with little additional income but with an additional burden of debt to pay. Under these conditions, neither the farmer nor the credit institution has benefited.

For credit to be effective, the minimum of other services that usually must be provided include:

- a. Agricultural Extension to teach farmers how to use the credit profitably.
- b. A farm supply system that ensures that the fertilisers, seeds, pesticides and the like are available to the farmer at the right time, in the required amounts and of the proper quality.
- c. A marketing organisation which provides a convenient, stable and profitable outlet for the farmers' products.

If these minimum prerequisites do not exist, they will need to be provided before an effective credit program can be developed. However, even where these other services are present, they frequently are not properly coordinated with the credit program, and as a result, the pay-off is not fully realised. The farmer may have received the necessary training for the productive use of credit, but the supplies may have failed to arrive, or he may have received both the credit and the supplies without instruction as to their use. Perhaps everything has gone well and the farmer is blessed with a large crop, only to find that he cannot sell it except at prices so low as to wipe out any reward for his extra effort and risk.

While everyone agrees on the need for coordination of services, achieving it in the field prove to be very difficult. The problem is so

complicated that at present, different government units, such as extension, credit and cooperatives are usually separate organisations having their own staff and budgets. Although there may be coordination at the national and state levels, there is often little among the staff at the village level where it is most crucial. Each of the government officials tends to work alone and to restrict his dealings with farmers to problems in his specific area of responsibility. This wastes resources and confuses farmers.

2.3.5 Inadequate Supply of Loanable Funds

Public credit institutions frequently face the problem of both inadequate and fluctuating supplies of funds to support their loan programmes. Institutions with unreliable funding soon face a crisis of confidence with farmer clients when the latter learn they cannot obtain the promised funds. If funds from outside sources are involved, they may be delayed or reduced in amount for a variety of political and other reasons. If the institution's funds are obtained from the federal government, unexpected national budget problems or bureaucratic procedures may delay or reduce the amount of loan funds available to the credit institution and the consequences for both the farmers and the credit organisation are serious. Once a credit institution has been capitalised, it is hoped that it will be able at least to continue operations at a specified level by making new loans as old ones are repaid. Unexpectedly, high defaults and administrative costs frequently exceed the organisation's budgeted levels so additional capital from government or outside sources is required if the loan programme is to continue at the planned level. Also, institution may need additional funds because inflation has reduced amount of agricultural production it can finance with its existing funds.

The problem is aggravated by government restrictions on the rate of interest the organisation can charge its borrowers. Thus, in practice, government credit institutions are often not self-supporting, at least in their early stages, and consequently face a continuing problem of obtaining new funds to sustain their operations.

2.3.6 Personnel Problems

Public credit institutions generally face the same staff problems as other government organisations in developing countries. They may be able to fill their staff positions, but frequently not by individuals with the desired background, training and dedication. The field worker's technical competence and his ability to gain the confidence of farmers are especially important. Williams and Miller have expressed concern on this point based on their experience in Mexico. Thus; "a fundamental characteristic of credit programs is their tendency to expand over a wide

range of technology which often and all too soon exceeds the training and experience of the field staff. In turn, as the ignorance of field staff is exposed, farmers' confidence in the staff may be seriously eroded, with debilitating impact on the whole programme. The confidence and vitality of the staff are undermined under these conditions, with costly result".

When lack of training is the limitation, institutions have organised short courses and special training programs in cooperation with universities, other government agencies and international organisations.

It should be recognised that some of the staff problems encountered by lending institutions are brought about by personnel policies within the government itself. These policies may make it difficult to reward superior performance, and may also encourage the transfer of key staff members to another government unit before they have had time to develop competence in their present position.

2.3.7 Illiteracy of the Small-Scale Farmers

Illiteracy of the farmers constitutes a major obstacle to the ease of flow of funds to the agricultural sector through the formal credit institution. Previous studies showed that small scale farmers' illiteracy rate in the southern zone of the country varies from 60-80 percent; and this could be worse in the Northern zone. The illiteracy of farmers tends to have some negative multiplier effects on banks funding of agriculture.

Farmers' inability to read and/or write makes it difficult for them to complete necessary loan forms. Even when farmers are assisted by others to complete the forms, the terms of loans may not be fully understood and appreciated. For example, farmers may not understand the economic and legal implications of the repayment plan with respect to farm cash flows and timing of drawing down on loans.

2.3.8 Lack of Security for Loans

Providing security for loans has been a major problem for small holder farmers in Nigeria. The main type of security is land. But often, the small-holders may not own the land on which they farm or may not have clear title to them, thereby making it impossible for such lands to be used as collateral. This situation arises because of the inherent difficulty in obtaining Certificate of Occupancy (title to land) from either the Local Government Authority or the State Government, on whom the powers are vested.

The 1978 Land Use Act, which vested ownership of land in the federal, state or local government depending on location, has further

incapacitated the smallholder farmer. The issue of security is the most crucial factor militating against farmers obtaining loans from the banks. Six of the nine banks responding to questions on constraints in extending loans to farmers, ranked lack of security as first. Two banks ranked it second while one ranked it third. Other form of security lacking by small scale farmers is the minimum savings for credit worthiness. This is because the small farmers are poor and their marginal propensity to consume (MPC) is high while their marginal propensity to save (MPS) is very low.

2.3.9 Low Interest Rate Charges on Agricultural Loan

The interest rates that government lending institutions charge on agricultural loans are extra-ordinarily low compared with the rates charged on other sectors. Studies revealed that between 1964 and 1982 formal lending institutions were obliged to charge six percent interest rate on loan meant for agricultural sector. The low interest rates made lending to small-scale farmers and recovery problematic for government financial institutions. Some authors have argued that the low interest rate was actually a disincentive to investment, encouraging diversion of funds meant for agricultural production for consumption. It also compounds the problem of government lending institutions to recover loans with adequate margins.

2.3.10 The High Credit Delivery Cost

The high credit delivery cost severely restricts government lending institutions to reach the deserving farmers. The small-scale farmers that should constitute the centre piece of formal institutional lending to agriculture are in millions and widely dispersed. Identifying these small-scale farmers imposes high administrative and operational costs on the financial institutions. Furthermore, limited executive capacity of credit institutions when coupled with scarcity of funds aggravates the problem of high credit delivery cost for lending institutions.

Self-Assessment Exercises

- 1 Explain how illiteracy of small-scale farmers affect lending agencies.
2. For credit to be effective, the minimum of other services that usually must be provided include?

2.4 Summary

You have learnt that some of the problems encountered by government financial institutions include high administrative costs, high default rate, complicated administrative procedures, poor communication with other agricultural services, inadequate supply of loan able funds, personnel, illiteracy among small scale farmers, lack of security for loans, low interest rates and high credit delivery cost.

In this unit, you have also learnt that:

- Administrative costs are necessary because these three costs need to be covered:
 - ✓ the costs the agency incurs to obtain the funds,
 - ✓ the loss of capital through loan defaults, and
 - ✓ the administrative costs of operating the credit agency.
- Loan repayment is poor because some borrowers believe it is government money that does not need to be repaid. Some others feel it is their own portion of the national cake.
- Complex administrative procedure discourages many borrowers.
- Poor coordination between the extension, input suppliers and market organisation are militating factors.
- Supply of funds for loans may sometimes be inadequate.
- Personnel sometimes are technically incompetent.
- Illiteracy leads to lack of understanding by the farmers.
- Land sometimes cannot be used as collateral i.e., lack of security for loans.
- Low interest rate charged on credit by government may be a disincentive.
- High delivery costs could also be a challenge.

2.5 References/Further Readings/Web Resources

- Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.
- Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.
- Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

2.6 Possible Answers to Self-Assessment Exercise(s)

1.

Illiteracy of the farmers constitutes a major obstacle to the ease of flow of funds to the agricultural sector through the formal credit institution. Previous studies showed that small scale farmers' illiteracy rate in the southern zone of the country varies from 60-80 percent; and this could be worse in the Northern zone. The illiteracy of farmers tends to have some negative multiplier effects on banks funding of agriculture.

Farmers' inability to read and/or write makes it difficult for them to complete necessary loan forms. Even when farmers are assisted by others to complete the forms, the terms of loans may not be fully understood and appreciated. For example, farmers may not understand the economic and legal implications of the repayment plan with respect to farm cash flows and timing of drawing down on loans.

2. For credit to be effective, the minimum of other services that usually must be provided include:

- a. Agricultural Extension to teach farmers how to use the credit profitably.
- b. A farm supply system that ensures that the fertilisers, seeds pesticides and the like are available to the farmer at the right time, in the required amounts, and of the proper quality.
- c. A marketing organisation which provides a convenient, stable and profitable outlet for the farmers' products.

Unit 3 Agricultural Loan Delinquency and Diversion in Nigeria

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Loan Delinquency
 - 3.3.1 Causes of Loan Delinquency in Nigeria
- 3.4 Loan Diversion
 - 3.4.1 Causes of Loan Diversion
 - 3.4.2 Suggested Ways of Reducing Agricultural Loan Delinquency and Diversion
 - 3.4.3 Delinquency and Diversion Complementarily
- 3.5 Summary
- 3.6 References/Further Readings/Web Resources
- 3.7 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

You had seen in previous units that the financial institutions face a lot of challenges in offering credit to farmers. When farmers take loan in Nigeria, most of them find it difficult to repay. Most of the reasons have been considered in earlier units, but two key issues need further attention. These are loan delinquency and loan diversion. This unit takes care of them.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- discuss the causes of loan delinquencies in Nigeria
- explain causes of loan diversion
- explain the way forward in minimising the two.

3.3 Loan Delinquency

Agricultural loan delinquency refers to the inability of the borrower to repay funds borrowed under agreed repayment conditions. Loan delinquency completely incapacitates the sustainability of established financial institutions. Consequently, such credit institutions rely completely on government allocations to survive or remain in operation. Loan delinquency deprives credit-worthy farmers the opportunity of enjoying agricultural credit facilities.

Some scholars viewed agricultural loan delinquency as socially and economically undesirable and that it is partly responsible for resource mismanagement. It is therefore important to understand why agricultural loan delinquency is common among farmers in developing nations; this will help in suggesting ways of eliminating or reducing the problem.

3.3.1 Causes of Loan Delinquency in Nigeria

i. Borrowers' Attitude

Some borrowers deliberately refuse to repay loans. Such borrowers believe that credit from the formal lenders is government money and therefore see it as their own share of the national cake. Many borrowers naturally have a poor credit repayment record, such borrowers would not just want to repay any credit. They may have used the credit for consumption purposes instead of production.

ii. Natural Disasters and Calamities

Because of the biological nature of agriculture, the farmer is exposed to high risks and uncertainties. For instance, under rainfed agriculture, the yield of crops will depend upon the amount of rainfall during a given period, and the rains may not fall at the proper time. In addition, the outbreak of pests and diseases may also affect crop yield and in extreme cases, disease outbreak could wipe out a whole livestock population on the farm.

Apart from all these, both the inputs which the farmers use and the output which they produce are subject to wide price fluctuations. A good harvest that is accompanied with good produce prices would lead to higher income and thus higher probability and ability to repay loans.

On the other hand, poor yield accompanied with low produce prices would mean higher probability of loan delinquency. Sickness of farmers or their animals may also contribute to loan delinquency as a sick farmer is likely to divert production loan to settle hospital bills.

iii. Poor Assessment of Assets Value by Lending Institutions

Assessment value of assets is sometimes overlooked by bank officials due to the past credential and available collateral security which may be misleading. An asset here refers to any item of value owned by the prospective borrower. This includes liquid cash, promissory notes, the value of farm produce or

livestock, the value of working and long-term assets. All these assets should be correctly assessed before funds are released to the farmer. This helps to create an impression of the farmer's repayment ability.

When assets are poorly assessed, there is the tendency to release excess fund or too little funds. Excess release of funds can lead to diversion of loan for consumption and other purposes. On the other hand, too little funds will lead to non-completion of intended farm projects. These situations can influence delinquency.

iv. Poor Project Monitoring/Supervision

Inadequate supervision aggravates loan delinquency. The utilisation of credit for the purpose for which it was advanced is necessary to achieve the objectives of increasing production and income of the borrowers. In Vandeikya Local Government Area of Benue State, it was found that delinquent borrowers had an average of one visit by extension agents, while the nondelinquent borrowers had an average of four visits by extension agents, thus, the later had higher yields per ha and therefore higher income.

v. Untimely Release of Funds (Loan)

Factors responsible for the undue delay in the processing and release of credit to farmers include over centralised operations and inefficient processing of loan applications by the lending institution. It has been established that coordination and interaction between lenders and the borrower influence timeliness of credit. Ineffective coordination and interaction lead to late release of funds which results in poor yield and thus loan default (delinquency).

Some previous studies have identified one period of critical credit need which coincided with the period of labour bottle-neck, which is the period of weeding of established crops. It has been observed that funds were released slightly after the bottle-neck period (land clearing and cultivation) which accounted for about 60% of diversion of loan to non-farm activities such as school fees, hospital bills, ceremonies and litigations with resultant effect of low-income generation and consequently loan delinquency.

vi. Poor Producer Price

Unsatisfactory producer price leads to loan delinquency. For farmers to receive good producer prices for their produce, such produce must not be sold immediately after harvest. Farmers who sell their produce immediately after harvest due to cash

pressure are bound to receive very low prices, thereby reducing their income and aiding delinquency. Those farmers who are able to store their produce for four to six months after harvest, with little or no storage cost in their homes, are likely to receive good prices for their produce. They will therefore be able to increase their ability to repay the loan.

vii. Low Literacy Level of the Borrowers

Educated borrowers are easier to deal with, probably because they are more enlightened. They understand the need to repay borrowed funds in order to allow for the continuity or sustainability of the credit programme. Delinquency has been reported to be low among educated farmers. However, farmers that were not educated misunderstood the goal of credit. Thus, a high percentage of this group of farmers used the credit to marry more wives, feed more mouths; consequently, delinquency among low educated farmers was high.

viii. High Cost of Borrowing

It is generally accepted that high cost of borrowing encourages delinquency. High interest rate of agricultural loans, coupled with high transactional cost significantly increase the money cost of agricultural lending. Consequently, farmers who borrow at high interest rates may become delinquent.

ix. Total Value of Production

The income of the farmer depends on the total value of production. In order to generate excess income, the borrower's production should be high and well above subsistence level.

Studies in south-west Nigeria revealed that the small-scale farmer spends most of his income on consumption and even borrows to support consumption within pre-harvest season. Therefore, the income of the farmer must be significantly above his consumption requirement in order to avoid loan default (delinquency). The income of most small-scale farmers in Nigeria is very low, thus most of them default on loan borrowed.

x. Granting Credit on Social/Political Grounds

Sometimes farmers are given loan because they are friends to the bank manager or because they are of the same tribe. Similarly, farmers may be granted loans on political grounds without considering the viability of the project. When any of these two happens, the farmers who are not credit-worthy misuse the loan and refuse to pay back when the loan is due.

3.4 Loan Diversion

This refers to the use of credit by the beneficiary for purposes other than for what it was granted. In other words, loan diversion occurs when the borrower uses the funds outside the terms of agreement between him and the lender. For instance, if a farmer collects loan for the purpose of cultivating crops but instead uses the funds to pay school fees or engage in petty trading; this is a clear case of loan diversion. Credit is given to the farmer with the hope that the availability of such funds will enhance his farm productivity, but when such money is used for other things, it is referred to as loan diversion.

3.4.1 Causes of Loan Diversion

i. Late Disbursement of Loan

Funds for agricultural production purposes should be made available to farmers during land clearing, land preparation, sowing, weeding or during harvesting. Most farmers would want credit at the beginning of the rainy season rather than at the peak periods of farming activities. Timeliness in disbursement of loan is very crucial if the farmer is to productively utilise such funds.

However, if loans are not disbursed at the right time, the tendency is for the farmer to divert such funds to other unproductive ventures such as family consumption. Since farming operations are weather and time specific, it would be unrealistic to release agricultural loans for crops whose planting periods have elapsed.

ii. Inappropriate Loan Supervision

Appropriate type and level of technical loan supervision are necessary to ensure that funds collected through credit are used for the purpose for which they were requested and granted.

Adequate and qualified numbers of staff are required for credit supervision and administration. Inappropriate credit supervision and follow-up has been largely responsible for the failure of credit programmes in Nigeria and in most developing countries. This has made possible the diversion of agricultural loans to purposes other than those for which the loans were granted.

iii. Double-digit Interest Rate

The Central Bank of Nigeria determines the rate of interest charged on agricultural loans by commercial banks. This interest rate is usually lower than the market rate. While banks try in their own way to exhibit social responsibility, they are certainly not charitable organisations. It is therefore only natural for

bankers to charge double-digit interest rate for those operations from which sufficient income is guaranteed for their participation. Using interest as the proxy for bank earnings, even the prevailing double-digit interest rate regime does not adequately cover the cost of funds and credit administration.

Unfortunately, most agricultural projects cannot support a double-digit interest rate, hence the constant clamour for interest rate concessions by farmers. When banks charge a double-digit interest rate, farmers divert credit to other uses.

iv. Political Influence

Political influence which is a common feature in most developing countries hampers the performance of financial institutions. Powerful individuals who are politically connected take undue advantage of the relatively cheap agricultural loans and divert them to non-farm purposes such as speculative trading and private money lending. This was the practice in the 1980s in Nigeria when people collected agricultural loans and fixed them in merchant banks in order to get profit.

v. Size of loan

It is very important to determine the right amount of credit to give a farmer as granting him “too little or too much” can be counter-productive. When credit released to a farmer does not meet his farm needs at the right time as is always the case with agricultural loan, and then the tendency is for the farmer to divert such loan to other purposes. Some farmers also double the amount of credit they need, thus financial institutions usually cut down the requests and give most farmers half. When this happens, those farmers who demanded for the amount they need are given less and this leads to diversion.

vi. Nature of Agricultural Production

Agricultural production is biological in nature and is characterised by all kinds of risks and production uncertainties. This is understandable because the biological and climatic factors which affect agricultural production are outside the farmer’s control. The main objective of the farmer, most of the time, is to produce food for his family’s consumption. Therefore, even when loans are taken for agricultural production, part of it is diverted to other non-agricultural ventures like petty trading where risk is lower and the rate of return is higher. This serves as a means of diversification so as to reduce risk.

vii. Form of Disbursement

Agricultural credit to farmers can either be in cash or in kind. However, most credit institutions prefer to provide credit in cash probably because it is cheaper and more convenient to do so. Provision of credit in kind could minimise diversion of funds but this does not mean that farmers would desist from converting production credit into consumption credit especially where consumption credit is ignored by the credit institution. It has been discovered that cash payment if released at a time when the planting date and time for various cultural operations have passed, encourages diversion of production credit to consumption.

Self-Assessment Exercises

1. How does late disbursement of funds contribute to loan diversion among farmers?
2. Suggest any five ways of reducing Agricultural Loan Delinquency and Diversion.

3.4.2 Suggested Ways of Reducing Agricultural Loan Delinquency and Diversion

- i. Early processing of loan applications and timely disbursement (release) of loan facility to coincide with the periods of requirements for such funds will enable farmers to execute farming operations at the right time thereby increasing their productivity and thus enhancing their ability to repay borrowed funds.
- ii. Agricultural loans should reflect the production need and income of the farmer (borrower) in order to avoid a monumental shift in consumption level of the small-scale farmer to higher levels at the expense of increased agricultural production. On the other hand, when agricultural loan is too small to meet the farmer's supply need, the possibility of loan diversion becomes high. It is therefore pertinent to determine the appropriate volume of loan required by the farmer.
- iii. The lending institutions should design ways of identifying the real farmer and make credit available to him with ease. This should be complimented with effective monitoring to ensure such credit is used for the intended agricultural use.
- iv. Local extension agents should pay more frequent useful visits to improve farmers' ability to adopt recommended practices. This

will also help to educate the farmers on the need to honour loan agreements while lending institutions should embark on enlightenment campaigns to change farmers' attitude towards loan default.

- v. The type or form of credit should be optional. This will give the farmer the opportunity to decide whether to take cash or kind or a combination of both. The provision of credit either in cash or kind should be promptly delivered to avoid diversion.
- vi. Agricultural credit should not be restricted to production alone; consumption credit, especially to small farmers, is necessary because it helps farmers to be more productive in terms of their labour input. The periods before and after the planting season are usually lean ones, during which farmers hardly have enough to eat and this adversely affects their productivity. Consumption credit to farmers at such periods can thus provide the necessary impetus to increasing labour productivity on farms and hence agricultural productivity.
- vii. Credit as well as extension services can be delivered through cooperative societies in a cheaper and more effective manner.
- viii. Support industries that can locally produce quality products and supply agricultural inputs such as herbicides, insecticides, fungicides and fertilisers in sufficient quantities and affordable prices to meet farmers' demand should be established.

3.4.3 Delinquency and Diversion Complementarily

Loan delinquency and loan diversion are complimenting each other i.e., one leads to the other. A critical analysis shows that agricultural loan diversion is often responsible for loan delinquency among small scale farmers. It is therefore pertinent to address the problem of loan diversion so that farmers will use agricultural credit for the purpose for which it was requested and granted.

3.5 Summary

In this unit, you have learnt that causes of loan delinquencies in Nigeria are due to many factors ranging from natural to human made problems. Causes of loan diversion include inadequate loan size and late disbursement among others. The way forward is to minimise these aforementioned causes.

3.6 References/Further Reading/Web Sources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

3.7 Possible Answers to Self-Assessment Exercise(s)

1.

Funds for agricultural production purposes should be made available to farmers during land clearing, land preparation, sowing, weeding or during harvesting. Most farmers would want credit at the beginning of the rainy season rather than at the peak periods of farming activities. Timeliness in disbursement of loan is very crucial, if the farmer is to productively utilize such funds.

However, if loans are not disbursed at the right time, the tendency is for the farmer to divert such funds to other unproductive ventures such as family consumption. Since farming operations are weather and time specific, it would be unrealistic to release agricultural loans for crops whose planting periods have elapsed.

2. **Suggested Ways of Reducing Agricultural Loan Delinquency and Diversion are:**

- i. Early processing of loan applications and timely disbursement (release) of loan facility to coincide with the periods of requirements for such funds will enable farmers to execute farming operations at the right time thereby increasing their productivity and thus enhancing their ability to repay borrowed funds.
- ii. Agricultural loans should reflect the production need and income of the farmer (borrower) in order to avoid a monumental shift in consumption level of the small-scale farmer to higher levels at the expense of increased agricultural production.
- iii. The lending institutions should design ways of identifying the real farmer and make credit available to him with ease. This should be complimented with effective monitoring to ensure such credit is used for the intended agricultural use.
Local extension agents should pay more frequent useful visits to improve farmers' ability to adopt recommended practices. This will also help to educate the farmers on the need to honour loan agreements while lending institutions should embark on enlightenment campaigns to change farmers' attitude towards loan default.
- iv. The type or form of credit should be optional. This will give the farmer the opportunity to decide whether to take cash or kind or a combination of both. The provision of credit either in cash or kind should be promptly delivered to avoid diversion.
- v. Agricultural credit should not be restricted to production alone; consumption credit, especially to small farmers, is necessary because it helps farmers to be more productive in terms of their labour input.
- vi. Credit as well as extension services can be delivered through cooperative societies in a cheaper and more effective manner.
- vii. Support industries that can locally produce quality products and supply agricultural inputs such as herbicides, insecticides, fungicides and fertilisers in sufficient quantities and affordable prices to meet farmers demand should be established (**Ans 5**).

Unit 4 Subsidising Agricultural Credit and Inputs in Nigeria

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Argument in Favour of Subsidy on Credit and Inputs to Farmers
- 4.4 Argument against Subsidising Credit and Inputs of Farmers
- 4.5 Summary
- 4.6 References/Further Readings/Web Resources
- 4.7 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

Credit and input subsidy can be defined as the timely provision of agricultural credit and inputs to farmers at a price that is lower than the prevailing market price so as to make them affordable to peasant farmers. In Nigeria, there are two schools of thought on credit and input subsidy. The first school contends that government ought to provide agricultural subsidy for both credit and farm inputs to minimise production cost, while the second school of thought argues that providing agricultural subsidy for credit and inputs of farmers should be discouraged.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- discuss arguments in favour of giving subsidies on credit to farmers
- discuss arguments against giving subsidies on credit to farmers.

4.3 Argument in Favour of Subsidy on Credit and Inputs to Farmers

i. High Productivity

It is argued that when credit and inputs for agriculture are subsidised, peasant farmers will be able to get more of the inputs with a given sum of money. For example, if farmer “A” has one hundred thousand naira (₦100,000.00) to buy inputs that cost ₦5,000.00 per unit, he will only buy 20 units; but if the government subsidises the sale of the inputs and it now costs ₦2,500.00 per unit, farmer “A” will now be able to buy 40 units with the same amount of money. Thus, farmer A will have more

inputs for production, *ceteris paribus*, at the end of the farming season, he will also produce double what he would have produced if there were no subsidy.

ii. Increase Income to Farmers

When credit and farm inputs are subsidised, the cost of production is reduced and more produce will be produced with the same amount of money. When this happens, the revenue accruable to the farmers will increase compared to when the inputs were not subsidised. The farmer will thus have more income to meet other basic needs. As his income increases, his living standard will also improve.

Increased yield will also lead to the optimum availability of agricultural produce. The government could buy off the excess produce to store and release for sale during off season when prices tend to be high. This will make such produce available all year round and this will lead to food security for the nation.

iii. Reasonable Price of Commodity to Consumers

When credit and agricultural inputs are subsidised, farmers will produce at very low cost. When production cost is low, selling price is also likely to be low because farmers will be content with normal profit. The subsidy will thus not benefit the farmers alone, but will benefit the consumers and public also. This is because they will be able to buy at affordable prices. Also, when credit and inputs are subsidised, farmers will be encouraged to go into capital intensive agriculture. When this happens, more land will be cultivated and this will lead to increased employment due to processing and marketing of the farm produce.

iv. Development

Many development-economists regard subsidy on agricultural inputs as desirable. According to them, farm input subsidy plays some roles such as: stimulating desired resource allocation pattern, income distribution, a tool for cushioning farmers against inflation in production costs, a tool for compensating distortions and an incentive for new entrants into farm investment.

It is further argued that, given the highly protective agricultural policies of the developed countries, government of less developed countries must help their farmers because agricultural production is highly susceptible to the vicissitudes of weather conditions and farmers in less developed countries lack articulate voice in political affairs. It is further argued that government of developing countries wishing to increase farmers' income may

either operate by raising producer price for the products or by lowering the costs of inputs. They tend to favour the latter course since it gives a greater result for the same expenditure.

v. Adoption Argument

Subsidies on credit and interest rates are needed to induce farmers to adopt formal credit and use same to purchase modern productive inputs. This adoption argument holds that small farmers will not borrow from the formal credit sources unless low rates are charged; that they will not adopt profitable new technology unless special inducements are given. The advocates contend that low interest rates are necessary to offset the uncertainties that are associated with adoption of new technologies.

Furthermore, cheap credit policies, especially for small farmers, relates to equity or income transfer objective. Policy makers who have compassion for the economic plight of the rural poor argue that low interest rates on agricultural loan are an easy way to transfer additional purchasing power to the rural poor.

vi. Encourage Youths to Remain in Rural Areas

Subsidising credit and inputs for agriculture will discourage rural urban drift among young people who always run to the urban centres to search for white collar jobs. This happens when the youths discover that agriculture has become profitable and that they will earn more money and less stress than their counterpart who are in the urban centres. In addition, with the money from agriculture, they can afford to buy and enjoy attractive things like television sets, video sets and motorcycles that used to pull them to the urban centres. Also, subsidies on credit and inputs may perform better in alleviating poverty and contribute to rural development.

SELF-ASSESSMENT EXERCISES

1. You have been appointed to be the Commissioner of Agriculture in your State. Make a brief speech in favour of government subsidising credit and inputs of agriculture will encourage youths to embrace farming.
2. How does corruption affect subsidising credit and inputs for farmers?

4.4 Argument Against Subsidising Credit and Inputs of Farmers

Many governments have intervened in financial markets to expand credit for the poor through large-scale subsidised credit and input programmes. These efforts have been justified on several grounds, including the perceived inability of the poor to pay market interest rates, formal lenders' unwillingness to lend to the poor because they are high-risk, the belief that lenders could be forced to lend to the poor and the perceived exploitative behaviour of informal lenders. But these perceptions have turned out to be unsubstantiated or partially incorrect because of the arguments below:

i. Farmers need not be bribed

Most farmers do not have to be bribed with cheap credit or subsidised inputs to adopt profitable innovations if there is satisfactory market for the additional output and if the extension workers recognise that, if they try, they could induce the farmers to finance the purchase of new inputs or the new tools from their own resources. Furthermore, it was questioned; for how long will the cheap credit and subsidised inputs be? Since the policy cannot continue forever, it is not expedient to start what the government cannot continue to sustain.

ii. Discouraging both savings and flow of credit

Economists are generally agreed that it is difficult to justify low interest rates to small farmers since this tends to discourage both savings and the flow of credit from them. It also fails to encourage the most productive use of credit. In addition, low rate of credit also means that credit programmes cannot be self-supporting but must be ever dependent on the continued willingness of government to provide large grants for their existence. This has very serious implications.

iii. Demand will not equal supply

Adams has pointed out that at low interest rates, credit demand often exceeds the supply to loanable funds. Lending agencies therefore, select only those borrowers who have excellent credit ratings. In Nigeria, small farmers do not have excellent credit ratings; therefore, the credit will go to other people while the small farmers will be denied access to credit. In addition, artificially low interest rates and credit regulations also distort resource allocation and often lead to political patronage. When these happen, it is the small farmers that suffer.

iv. Siphoned off into other investment

When credit rates are subsidised, the rate becomes much lower than the rate charged in the other sectors of the economy. This creates a dangerous situation where the cheap farm credit will be siphoned off into investments which has nothing to do with developing the small farmers. The subsidy in this case does not affect production of the agricultural sector since it does not reach those for whom it was intended.

Experience with more than 20 years of donor support shows that subsidised formal credit ends up with non-poor. The intervention has rarely achieved its stated objectives. Despite many efforts to channel credit to the poor, only 5 percent of farms in Africa and 15 percent of farms in Asia and Latin America have had access to formal credit. Subsidised credit has largely become a transfer to loan recipients, usually the non-poor.

v. Investment policy distortion

Another disadvantage associated with subsidised interest rates is the familiar argument that the farmers' investment policies may be distorted since the true cost of capital is not reflected in the farmers' transactions. A shift from more reliance on capital and less on labour might be expected. The disadvantages inherent in this are further compounded because such a shift in production factor usually involves an increased managerial task. Cheap credit may cause wasteful use of capital and even premature consumption, thus reducing capital formation at the village level.

vi. Corruption

When credit is subsidised, the demand for credit always exceeds supply. This always leads to rationing. The need for rationing causes several other difficulties, such as favouritism, bribery and other ills associated with scarcity of credit. Invariably, it also places an extra burden on the administrative staff of credit institutions and because of pressure from would-be borrowers, a situation exists where the chances of corruption are great. Similarly, there is always the danger that a credit institution lending money at a subsidised rate of interest will be at the mercy of its political master and may find itself insufficiently compensated. In these circumstances, the credit institution faces the danger of recapitalisation because it will most certainly be forced into a situation where it concentrates on large loans to the detriment of small farmers in order to economise and may find difficulty raising capital, partly because of its inability to offer attractive interest rates on capital.

4.5 Summary

In this unit, you have learnt that:

- Arguments in favour of giving credits to farmers are as follows:
 - ✓ there is no need to bribe farmers to use credit
 - ✓ higher productivity
 - ✓ increase in income
 - ✓ reasonable price of commodity to consumers due to lower production cost
 - ✓ faster development of the agricultural sector
 - ✓ encourage adoption of new technologies
 - ✓ encourage youth to remain in rural areas
- Arguments against giving credit subsidies to farmers are that:
 - ✓ it will discourage both savings and flow of credit
 - ✓ demand will not equal supply
 - ✓ funds will be siphoned into other investments
 - ✓ there will be investment policy distortions
 - ✓ there will be corruption

4.6 References/Further Reading/Web Sources

Nelson, A. G. & Murray, W. G. (1968). *Agricultural Finance*. USA: Iowa State University Press.

Olukosi, J. O. & Alamu, J. F. (2013). *Introduction to Agricultural Finance: Principles and Applications*. Nigeria: Great Glory Publishers.

Reddy, S. S. & Ram, P. R. (2004). *Agricultural Finance and Management*, New Delhi: Oxford & IBH Publishing Co. PVT.

4.7 Possible Answers to Self-Assessment Exercise(s)

1.

Subsidising credit and inputs for agriculture will discourage rural urban drift among young people who always run to the urban centres to search for white collar jobs. This happens when the youths discover that agriculture has become profitable and that they will earn more money and less stress than their counterpart who are in the urban centres. In addition, with the money from agriculture, they can afford to buy and enjoy attractive things like television sets, video sets and motorcycles that used to pull them to the urban centres. Also, subsidies on credit and inputs may perform better in alleviating poverty and contribute to rural development.

2. Corruption:

When credit is subsidised, the demand for credit always exceeds supply. This always leads to rationing. The need for rationing causes several other difficulties, such as favouritism, bribery and other ills associated with scarcity of credit. Invariably, it also places an extra burden on the administrative staff of credit institutions and because of pressure from would-be borrowers, a situation exists where the chances of corruption are great. Similarly, there is always the danger that a credit institution lending money at a subsidised rate of interest will be at the mercy of its political master and may find itself insufficiently compensated. In these circumstances, the credit institution faces the danger of recapitalisation, because it will most certainly be forced into a situation where it concentrates on large loans to the detriment of small farmers in order to economise and may find difficulty raising capital, partly because of its inability to offer attractive interest rates on capital.

MODULE 8 AGRICULTURAL INSURANCE

Unit 1	Meaning and Scope of Agricultural Insurance
Unit 2	Types of Agricultural Insurance and Insurability of Agricultural Risks
Unit 3	Agricultural Insurance in Nigeria
Unit 4	Risk Quantification

Unit 1 Meaning and Scope of Agricultural Insurance

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Meaning of Agricultural Insurance
- 1.4 Scope of Agricultural Insurance
- 1.5 Benefits of Agricultural Insurance
- 1.6 Summary
- 1.7 References/Further Readings/Web Resources
- 1.8 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

The farmer is the agent that is best positioned to know the dimension, characteristics and correlations of the risks that affect his farm. He is also the best positioned to evaluate the availability of different strategies to deal with this risk. It is the farmer's responsibility as manager of his own farming business to take the appropriate decisions to manage the risk associated with his economic activity- farming. The generic strategies to reduce risk are risk sharing, risk pooling and diversification. Insurance is one major way of pooling risk together with the aim of reducing the impact of risk when they occur.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain the meaning of insurance and agricultural insurance
- differentiate between self-insurance and commercial insurance
- state the merits and demerits of self-insurance.

1.3 Meaning of Agricultural Insurance

Agricultural insurance is a financial tool to transfer risks associated with farming to a third party via payment of a premium that reflects the true long-term cost to the insurer assuming those risks. Agricultural insurance is a special line of property insurance applied to agricultural firms. In recognition of the specialised nature of this type of insurance, insurance companies operating in the market either have dedicated agribusiness units or outsource the underwriting to agencies that specialise in it.

Agricultural insurance is defined in the Nigerian Agricultural Insurance Scheme (NAIS) operation guideline (1989) as the stabilisation of income, employment, prices and supplies of agricultural products by means of regular and deliberate savings and accumulation of funds in small instalment by many farmers in favourable time periods, to defend some or a few of the participants in bad time periods.

Thus, it may be seen as a kind of fund, into which all those insured will pay an assessed contribution (called premium), in return, those insured will have right to call on the fund for any appropriate payment should the insured event occur. The needs for agricultural insurance arose because the sector is exposed to varieties of risks and uncertainties.

There are several features of this type of insurance that validate it being treated as a special line of business. Difficulties in achieving adequate diversification because of the nature of the risk, asymmetries of information in underwriting, the geographical dispersion of agricultural production and the complexity of the biological processes of production, which requires skilled and expert underwriting, justify it being considered a special business line.

1.4 Scope of Agricultural Insurance

Basically, agricultural insurance is designed to provide covers for financial losses incurred due to reduction in expected outputs from agricultural products. The major products are crops and livestock. Others include fisheries and forestry. Crop insurance and livestock insurance provide the two broad categories for which commercial insurance covers are designed. Because of the complexities brought to agricultural ventures due to mechanisation, a broad range of traditional policies, namely personal accident, fire, vehicles, machinery and public liability covers are made essential parts of a comprehensive agricultural insurance package.

Agricultural investments, unfortunately, are among the riskiest economic ventures one can embark upon. The absolute dependence on unpredictable weather conditions, like hailstorm, flood, drought and other natural hazards make income from crop production to be very unstable. Other agricultural products like livestock, poultry and dairies are exposed to the risks which occur in catastrophic proportions. The recent cases of bird flu in Nigeria comes readily to mind. Agricultural insurance policies protect the farmer against these unforeseen circumstances by way of indemnification, it also serves as securities for banks for financial losses suffered by farmers from damages to their products and will provide funds for servicing loans. The capacity of the agricultural sector, to hedge itself from the vagaries and aberrations of nature, is considered critical to its development and growth. Many factors, including disasters, can slow the development process, by reducing domestic food supplies and raw materials in the short term. Natural disasters such as drought, floods and cyclones are a major source of risk in agriculture. A large-cropped expanse of land is vulnerable to drought in different degrees. Globally on an average, crops on million hectares of land are damaged annually by natural calamities and adverse seasonal conditions in the country, grossly impacting the level of agricultural productivity and production. The insurance need for agriculture cannot be over emphasised, as it is a highly risky economic activity, on account of its critical dependence on weather conditions.

Most farmers use various forms of insurance to protect against specific types of losses. Fire insurance provides liquidity to replace losses due to fire. Most farmers find that commercial fire insurance is more cost effective than self-insurance (maintaining a reserve of funds to offset a loss). Risks which have a low probability of occurrence and very adverse consequences are the most logical risks to insure against. Liability, major medical, disability and fire/extended coverage on buildings, equipment and livestock are examples of insurance which many farmers carry. Self-insurance, included in the normal cost of doing business, is generally more cost effective for risks which occur frequently and cause only minor problems. Insurance to protect against hog deaths in finishing could probably be obtained, but farmers typically average out these losses as part of normal production costs.

Many other types of insurance with different levels of coverage are available. One's financial position is important in determining whether to self-insure or buy commercial insurance. A farmer in a strong financial position using the car only to drive to church might logically decide not to carry collision insurance, even with a very high deductible. In contrast, another farmer in a weaker financial position whose spouse drives to work

every day may logically carry collision insurance with the minimum deductible. The nature of agricultural production and agricultural products has made the design and implementation of an appropriate insurance program for agriculture, a very complex and challenging task.

Self-Assessment Exercises

1. Define agricultural insurance according to NAIS.
2. Outline the benefits of agricultural insurance in Nigeria.

1.5 Benefits of Agricultural Insurance

Overall benefits of agricultural insurance are outlined below:

- i. Cushions the shock of disastrous crop and livestock loss by assuring farmers a minimum protection.
- ii. Crop and livestock insurance spread the losses over space and time. As agricultural income is an important factor in national income, crop insurance also has an effect on the prosperity of the country.
- iii. It gives farmers greater confidence in making greater investments in agriculture.
- iv. It improves the position of farmers in relation to agricultural credit.
- v. Government is relieved of present uncertain financial burden of providing relief.
- vi. It can help normalise the availability of supplies and stabilise prices.
- vii. It will help maintain the dignity of farmers.
- viii. It enables maintenance of systematic records of crop and livestock production.

1.6 Summary

In this unit, we have considered the meaning of insurance, self and commercial insurance; scope and benefits of agricultural insurance. Therefore, you have understood the need for insurance in agricultural sector as well as the scope of agricultural insurance

1.7 References/Further Readings/Web Resources

Government of India Planning Commission. *Risk Management in Agriculture for the Eleventh Five Year Plan (2007-2012.)* New Delhi.

1.8 Possible Answers to Self-Assessment Exercise(s)

1.

Agricultural insurance is defined in the Nigerian Agricultural Insurance Scheme (NAIS) operation guideline (1989) as the stabilisation of income, employment, prices and supplies of agricultural products by means of regular and deliberate savings and accumulation of funds in small instalment by many farmers in favourable time periods, to defend some or a few of the participants in bad time periods.

2. Benefits of agricultural insurance include:

- i. Cushions the shock of disastrous crop and livestock loss, by assuring farmers a minimum protection.
- ii. Crop and livestock Insurance spreads the losses over space and time. As agricultural income is an important factor in national income, crop insurance also has an effect on the prosperity of the country.
- iii. It gives farmers greater confidence, in making greater investments in agriculture.
- iv. It improves the position of farmers in relation to agricultural credit.
- v. Government is relieved of present uncertain financial burden of providing relief.
- vi. It can help normalise the availability of supplies and stabilise prices.
- vii. It will help maintain the dignity of farmers.
- viii. It enables maintenance of systematic records of crop and livestock production.

Unit 2 Types of Agricultural Insurance and Insurability of Agricultural Risks

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Insurability of Risks
- 2.4 Types of Agricultural Insurance
 - 2.4.1 Crop Insurance as a Risk Management Tool
 - 2.4.2 Livestock Insurance as a Risk Management Tool
- 2.5 Summary
- 2.6 References/Further Readings/Web Resources
- 2.7 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

Earlier on, you learnt that agricultural insurance is a financial tool to transfer risks associated with farming to a third party via payment of a premium that reflects the true long-term cost to the insurer assuming those risks. Agricultural insurance is a special line of property insurance applied to agricultural firms. So, in this unit, you will learn more about agricultural risks and insurance.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- state types of agricultural insurance
- explain the insurability of agricultural risk
- discuss crop and livestock insurance as risk management tools.

2.3 Insurability of Risks

It is not all risks that are insurable. To be insurable, a risk must satisfy the following main criteria:

- (i) The probability of a loss in the future should lend itself to estimation. This is possible only if reliable data of losses is available for a sufficiently long period in the past.
- (ii) The loss must be capable of being estimated in financial terms.
- (iii) The probability of occurrence needs to be in a medium range: if it is

too high, the premium will not be affordable; if it is too low, it will not be possible to use the record of occurrences to estimate the likely distribution as accurately as possible.

- (iv) Occurrence of an event, or the damage it causes, should not be affected by the insured's behaviour (moral hazard).
- (v) To the extent possible, the risk should be an independent risk.
- (vi) The risk must be of fortuitous character.
- (vii) It should be measurable in large number.
- (viii) The cost of insurance or premium should be within the means of the average farmer.

In line with condition for insurability of risk, the probability of occurrence of death, fire losses, accident are measurable, hence, insurable only because the number of observations is sufficiently large and is independently randomly distributed. Furthermore, risk and uncertainty that resulted from natural hazard also result in losses of not only on the field but during storage, packaging and marketing of agricultural commodities. Pests, diseases and parasitic attacks are also hazards that occur most frequently on the farm annually and they cause a very high percentage of both field and post-harvest losses of agricultural products. Pilferage is a social risk that farmers have to contend with in the farm at different stages of crop and livestock production; hence, if the pilferage is substantial and the losses can be estimated in financial term, then it is insurable risk.

Self-Assessment Exercises

1. What is pilferage?
2. What are the three types of insurance which all farmers should take?

2.4 Types of Agricultural Insurance

There are different types of agricultural insurance in countries where agricultural insurance has developed. The three types of insurance that all farmers should undertake are: 1) property and casualty insurance, 2) health, life and disability insurance, and 3) liability insurance. Crop insurance is a very important type of property insurance that can be used very effectively in conjunction with marketing plans to reduce marketing risk. Crop insurance can guarantee a level of production, thus removing the risk associated with forward pricing or selling crops that are yet to be produced.

Crop insurance will provide the tons of the product to deliver on a contract, should the insured producer suffer a loss prior to harvest. Medical expenses due to a serious illness or injury can wreak economic havoc on a family. Farmers are more likely to be disabled than killed in accidents and a good disability policy is as important as life insurance and is a good risk management tool. A liability policy protects a farmer against claims or lawsuits brought by persons whose property or person has allegedly been injured by the farmer's negligence.

2.4.1 Crop Insurance as a Risk Management Tool

Crop insurance is a mechanism to protect farmers against the uncertainties of crop production due to natural factors beyond farmer's control. It is also a financial mechanism, which minimises the uncertainty of loss in crop production, by pooling most uncertainties that impact crop yields, so that the burden of loss can be distributed. Crop production involves numerous risks - natural, social, economic and personal. However, the principal characteristic, which distinguishes crop production from any other activity, is its great dependence on nature. Crop production unlike almost any other activity, has to be carried on in the face of continual uncertainties arising out of diverse natural and social elements.

Normally, the greatest impact of all these elements falls on crops, which remain under the open skies for weeks and months. Uncertainty of crop yield is thus one of the basic risks, which every farmer has to face, more or less, in all countries, whether developed or developing. These risks are high; in developing countries, particularly in the tropics as in most of these countries, most farmers are poor with extremely limited means and resources. They cannot bear the risks of crop failure of a disastrous nature. It is true that much of the present uncertainty of crop production in developing countries like Nigeria could be removed by technical measures and improvements in the social and institutional set-up. The need for complete set of initiatives in this regard cannot be over-emphasised.

Still, a good deal of uncertainty will always be there, as no imaginable measure could make crop production completely independent of natural factors. Also, the physical measures envisioned, need to be justified by their cost-benefit ratio. There may be many places, for example, where flood is preventable, but the cost of prevention measures would be far out of proportion to their benefit. In such cases, it would be bad economics to spend more capital in preventing a risk, than would be lost by the risk itself (especially where capital is so scarce). Secondly, with a growing population constantly pressing against land, no part of it could be given up for

cultivation, simply because it is subject to periodical risks of failure. It is, as much in the country's interest, as in that of the individual owners that such lands should be kept under plough, even if there were occasional risks of failure.

Therefore, the risks of crop production have to be faced. However, a serious crop failure has a cascading effect leading to serious repercussions for the entire community. Calamities relief by the government is a privilege and not a right; hence, farmers cannot expect them always. Besides, Nigerian government response to risks in the farm often comes when the calamity affects a very large number of farmers. An important measure that is largely free from the above difficulties is crop insurance against all natural and unavoidable hazards.

2.4.2 Livestock Insurance as a Risk Management Tool

Livestock insurance is defined as a contract by which the insurer agrees to indemnify the insured against such loss sustained by reason of injury or the death of livestock by the happening of the perils specified or a contract to pay a certain sum of money on the death of an animal from disease or accident. Livestock industry is subject to outbreak of pests and diseases which often results in great losses to farmers. A recent experience of poultry farmers in Nigeria with the outbreak of avian flu led to loss of a large number of birds vis-a-vis financial losses. Disaster relief was granted to the poultry farmers to the tune of 631million naira.

Sometimes, risks may be farm or local specific and not a national issue; such might not attract disaster relief. To combat such risks, farmers need livestock insurance to be protected. Livestock insurance helps farmers who lost their animals to severe drought conditions and outbreak of pests and diseases as they often do, to receive monetary compensation to either allow them to restock faster, invest in other productive activities or even purchase food and other items of necessity. Livestock insurance protects pastoralists against the full impact of drought-related losses. Insurance programme encourages productivity and returns from livestock-based livelihoods.

2.5 Summary

In this unit, types of agricultural insurance and insurability of agricultural risks are the objects of discussion.

you have understood the basis for which agricultural risks can be insured, types of agricultural insurance and how each is used as a tool in risk management.

2.6 References/Further Readings/Web Resources

Government of India Planning Commission. *Risk Management in Agriculture for the Eleventh Five Year Plan (2007-2012.)* New Delhi.

2.7 Possible Answers to Self-Assessment Exercise(s)

1.

Pilferage is a social risk that farmers have to contend with in the farm at different stages of crop and livestock production; hence, if the pilferage is substantial and the losses can be estimated in financial term, then it is an insurable risk.

2. The three types of insurance that all farmers should undertake are:

- a. property and casualty insurance,
- b. health, life and disability insurance, and
- c. liability insurance.

Unit 3 Agricultural Insurance in Nigeria

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Evolution of Agricultural Insurance in Nigeria
- 3.4 History of Nigerian Agricultural Insurance Corporation (NAIC)
- 3.5 Objectives of Nigerian Agricultural Insurance Corporation
- 3.6 Problems of Nigeria Agricultural Insurance Scheme
- 3.7 Perils Cover
- 3.8 Conditions for the Insured
- 3.9 Indemnity
- 3.10 Summary
- 3.11 References/Further Readings/Web Resources
- 3.12 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

Insurance, an effective mechanism of transferring large risks to someone else has been in use in developed countries more than one hundred years ago. Commercial agricultural finance came into being 26 years ago, an indication that Nigeria is indeed a developing nation even in agricultural production, which has been the main economic backbone of the nation before the discovery of oil in late 60s.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- discuss the evolution of agricultural insurance in Nigeria
- state the objectives of Nigerian Agricultural Insurance Corporation (NAIC)
- identify the perils that are covered by NAIC
- explain the problems of Nigeria Agricultural Insurance Scheme.

3.3 Evolution of Agricultural Insurance in Nigeria

Agricultural insurance as an alternative for risk management actually started as crop hail insurance in Europe more than 100 years ago, and it spreads to the United States at the beginning of the century. It has since been embraced by a lot of developed and developing countries of the

World, viz- USA, Canada, Japan, Mexico, Brazil, Bolivia, Costa Rica, Panama, Mauritius, India, Australia, Iran, Sri Lanka, Zambia, Philippines, Israel, Chile, Jamaica, Egypt, Cyprus, Sweden, Bangladesh and Venezuela with varying degrees of successes and failures.

In Nigeria, commercial agricultural insurance scheme was pioneered by Niger Insurance in May, 1987. National Insurance Corporation of Nigeria (NICON) fully owned by the Federal Government and the National Cooperative Insurance Society of Nigeria (NCISN) were also known to have operated insurance schemes with agricultural implication on a limited commercial scale. Similarly, some banks such as the United Bank for Africa (UBA) and Union Bank of Nigeria which were actively involved in giving credit facilities to the agricultural sector had to raise the sum assured of life assurance of loan applicants to qualify as suitable collateral for providing loan. Agricultural Insurance Scheme (NAIS), which was formerly launched on the 15th of December, 1987, was later followed by the incorporation of the Nigeria Agricultural Insurance Company (NAIC) in 1988 to implement the scheme.

3.4 History of Nigerian Agricultural Insurance Corporation (NAIC)

Prior to the establishment of NAIC, Nigerian farmers suffered various losses on their investment and had no means of going back to production. The frustration made them to move into cities in droves in search of easy means of livelihood. This situation led to depletion of farming populace, which was a serious threat to food security. The Federal Government was disturbed by the ugly trend, hence the establishment of NAIC to address the need of farmers.

The need for a specialised Agricultural Insurance Company to provide insurance cover to farmers was informed by Government's concern over the vacuum created due to the unwillingness of conventional insurers to accept agricultural risks, which they considered too risky.

This led to the establishment of the Nigerian Agricultural Insurance Scheme on 15th of November, 1987. The implementation of the scheme was initially vested in the Nigerian Agricultural Insurance Company Limited, which was later incorporated in June, 1988 but later turned into a Corporation in 1993 by the enabling Act 37 of 1993. Nigerian Agricultural Insurance Corporation is therefore a wholly owned Federal Government of Nigeria insurance company set up specifically to provide agricultural risks insurance cover to Nigerian farmers.

a. Vision

To remain the pioneer and leader in the country's Agro-investment risk management and the preferred choice for general insurance.

b. Mission

Making investment in Agriculture and other sectors of the economy more attractive through efficient risk management that ensures prompt settlement of claims thereby improving agricultural output and promoting national development.

Risks in Agricultural undertakings are more widely spread and far reaching than in most other enterprises. This is because they go beyond all the well-known and researched entrepreneurial hazards and uncertainties of the modern business world. Such hazards include the vagaries of nature, inclement weather conditions, pests and diseases along with flood and fire outbreaks. All these impact very seriously on the success or failure of any agricultural enterprise. Therefore, any nation with a clear vision for boosting its agricultural production so as to meet the food needs of its populace and industries must of necessity put in place mechanisms that would reduce these risks and uncertainties to a bearable minimum. Therefore, the need, for a mechanism that functions specially to keep the farmers in business cannot be over-emphasised; hence, the necessity for an agricultural insurance scheme in Nigeria.

3.5 Objectives of Nigerian Agricultural Insurance Corporation

The broad objective of the Nigerian Agricultural Insurance Corporation (NAIC) is to protect the Nigerian farmer from the effects of natural hazards by introducing measures which shall ensure a prompt payment of appropriate indemnity (compensation) sufficient to keep the farmer in business after suffering a loss.

The Scheme is specially designed to:

- promote agricultural production since it would enhance greater confidence in adopting new and improved farming practices and at the same time bring about greater investments in the agricultural sector of the Nigerian economy, thereby increasing the total agricultural production;
- provide financial support to farmers in the event of losses arising from natural disasters;
- increase the flow of agricultural credit from lending institutions to the farmers;

- minimise or eliminate the need for emergency assistance provided by government during period of agricultural disasters.

3.6 Problems of Nigeria Agricultural Insurance Scheme

The efficiency of agricultural insurance scheme in Nigeria has been hampered by the following factors:

- (i) Inadequate infrastructure and administrative facilities.
- (ii) Shortage of trained manpower.
- (iii) Ignorance of farmers on the functions and merit of the scheme.
- (iv) Non-availability and unreliability of data useful for insurance purpose.
- (v) Inadequate and untimely funding.

(i) Inadequate infrastructure and support services

Inadequacy of infrastructural facilities such as good roads and other efficient means of transportation, good communication facilities, uninterrupted power supply, could hamper the successful operation of the scheme. These facilities are needed in order to facilitate prompt and speedy intimation of losses by the farmers for assessment of losses and payment of indemnities.

(ii) Inadequate funding

Adequate and timely funding of the scheme will be essential for its success. Agricultural insurance is a very costly venture and as such, arrangement for adequate funding should be made. Delay in approving and releasing funds and especially undue political interference in funding and management of the scheme will affect its success.

(iii) Lack of trained personnel

The scheme requires the availability of personnel trained in agriculture and insurance at the national, state and local government levels as evaluator, supervisors, loss adjusters, salesmen and extension staff.

(iv) Ignorance and lack of awareness of the scheme by farmers

The ignorance and lack of awareness by the majority of farmers of the need, practice and values of agricultural insurance, constitute problem to the scheme.

(v) Lack of data

A major problem affecting the scheme is the dearth of data on farm operations, particularly on crop yields and losses arising from natural hazards. These data are necessary for the computation of premiums and indemnities.

3.7 Perils Cover

The risks covered by NAIC are:

- (a) in the case of crops, damage or loss caused by
 - (i) fire, or
 - (ii) lightning, or
 - (iii) windstorm, or
 - (iv) flood, or
 - (v) drought, or
 - (vi) pests, or
 - (vii) invasion of farm by wild animal; and
- (b) in the case of livestock, death or injury caused by
 - (i) accident, or
 - (ii) disease, or
 - (iii) fire, or
 - (iv) lightning, or
 - (v) storm, or
 - (vi) flood.

3.8 Conditions for the Insured

1. A person insured under the Scheme shall satisfy such conditions relating to good husbandry as may be laid down from time to time, by the Corporation.
2. The rate of insurance premium payable under the Scheme by farmers shall be such percentage of the sum assured as the Corporation may, from time to time, determine having regard to the pure risk premium, reserve premium and administrative loading.
3. The Corporation shall subsidise the premium payable at such rate not exceeding 50 percent as it may, from time to time determined. Subsidy on premium shall:
 - (a) be paid to the Corporation by the Federal Government and the respective State Governments in the proportion of 37.5 percent and 12.5 percent respectively; and
 - (b) for a particular year, be paid within the first quarter of the following year.

Where a State Government defaults in its payment to the Corporation, the Federal Government shall cause the amount to be deducted from funds due to the defaulting State and remitted direct to the Corporation.

3.9 Indemnity

Indemnity shall be based:

- (a) in the case of crops, on approved input cost up to the time the loss occurred but if some crops were salvaged then, less the value of the crops actually harvested;
- (b) in the case of livestock, on a valuation table to be prepared by the Corporation for each class of stock; and
- (c) in the case of crops, livestock and other agricultural items specified, from time to time, by the Corporation, on agreed value of the crops, livestock or item.

A farmer shall not qualify for indemnity under this Decree unless:

- (a) the insurance cover was obtained before the damage or loss occurred;
- (b) he has a valid insurance cover at the time of damage or loss;
- (c) followed laid down practice for crop and livestock production;
- (d) the cause of damage or loss was one of the risks covered by the insurance policy;
- (e) the notification of the damage or loss was made within the stipulated time; and
- (f) he has satisfied such other conditions as the Corporation may, from time to time, specify.

Self-Assessment Exercises

1. State the conditions for the insured.
2. Differentiate between vision and mission in agricultural risk insurance.

3.10 Summary

Agricultural Insurance is relatively new in Nigeria and the benefits thereof have not been harnessed by farmers. NAIC is the only formal agricultural insurance company in Nigeria and their scope of operations is limited compare with scope of operations of agricultural insurance in developed countries.

In this unit, you have learnt about the agricultural insurance in Nigeria, the mission, vision and objectives of Nigerian Agricultural Insurance Corporation as well as the hindrances to its performance efficiency.

3.11 References/Further Readings/Web Resources

Aina, O.S. & Omonona, B.T. (2012). 'Nigeria Agricultural Insurance Scheme (NAIS): Prospect, Achievement and Problems'. *Global Advanced Research Journal of Agricultural Science*, 1(5) pp.97-103.

Nigeria Agricultural Insurance Scheme (NAIS). (1989). Operational Guideline for the Nigerian Agricultural Insurance Company.

3.12 Possible Answers to Self-Assessment Exercise(s)

1.

- i. A person insured under the Scheme shall satisfy such conditions relating to good husbandry as may be laid down, from time to time by the Corporation.
- ii. The rate of insurance premium payable under the Scheme by farmers shall be such percentage of the sum assured as the Corporation may, from time to time, determine having regard to the pure risk premium, reserve premium and administrative loading.
- iii. The Corporation shall subsidise the premium payable at such rate not exceeding 50 percent as it may, from time to time determined.

2.

a. Vision

To remain the pioneer and leader in the country's Agro-investment risk management and the preferred choice for general insurance.

b. Mission

Making investment in Agriculture and other sectors of the economy more attractive through efficient risk management that ensures prompt settlement of claims thereby improving Agricultural output and promoting National Development

Unit 4 Risk Quantification

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Meaning and Components of Risks
 - 4.3.1 Hazard
 - 4.3.2 Vulnerability
 - 4.3.3 Exposure
- 4.4 Potential Severity of Impact of Risk
 - 4.4.1 Composite Risk Index
- 4.5 Elements of Decision Making under Risk
- 4.6 Measuring Variability
- 4.7 Computing Expected Values
- 4.8 Summary
- 4.9 References/Further Readings/Web Resources
- 4.10 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

Risks that cannot be assessed quantitatively in terms of financial loss cannot be insured. The impact of risks and the severity of its impact are important information that is necessary for risk assessment. Risks must be evaluated in relation to their potential severity of impact after they have been identified. Generally, the assessment is in terms of the negative impact, such as damage or loss and to the probability of the occurrence of the risks.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define risk assessment
- identify the variables that should be quantified in risk measurement
- quantify agricultural risks.

4.3 Meaning and Components of Risks

Risk assessment is a systematic process for identifying and evaluating events (i.e. possible risks and opportunities) that could affect the achievement of objectives, positively or negatively. A robust risk

assessment process forms the foundation for an effective enterprise risk management program. Although being aware of a risk is clearly important, before one can consider managing it, one must actually assess the risk being considered. Risks (and their impacts) are assessed by quantifying three main variables: hazard, vulnerability and exposure.

4.3.1 Hazard

Hazard is the categorisation of the type of risk being considered - for example, weather, price, pest, policy, or market. The quantification of the hazard is then undertaken by assessing three sub-variables:

i. Likelihood/frequency

How often or likely is the risk to occur? Estimate the probability of the hazard. Probability tells you how often the hazard will affect some operation within the mission. If you have reliable data available, you can also express probability as a number, in terms of a ratio or as a percentage. Express the level of probability by using the following ranking levels, keep in mind the cumulative probability of the causes listed for the hazard.

For example, if there are four causes for a single hazard, the probability of its number occurrence will be greater than if there were only one cause. For future reference, farmers or farm manager should document the occurrence of hazard in their farms which can be used to assign probability to each hazard. Frequency of hazard can be documented thus:

- **Frequent** - occurs often, continuously experienced
- **Likely** - occurs several times
- **Occasional** - occurs sporadically
- **Seldom** - unlikely, but could occur at some time
- **Unlikely** - can assume it will not occur.

ii. Severity

This refers to the impact of loss from a risk. This, also, refers to the measurement of the amount of loss as against the frequency of the loss. In essence, the frequency of loss determines its value to the organisation. Severity of loss implies how grave the loss will be in terms of its occurrence to the organisation. In other words, severity measures the quantum of the loss of a risk that can occur or that had already occurred. The question here is, what are the likely fiscal impacts of such a risk if it occurs? The severity assessment should be based on the worst possible outcome that can be expected. It is

expressed in terms of the impact on mission, people, materials, facilities and environment.

iii. Spatial extent

Spatial extent refers to the widespread of the impact of the risk in terms of number of persons, village towns and/or the country affected.

4.3.2 Vulnerability

Is an estimation of what the impact of the realised risk would be given the assets affected by the event and taking into account the current ability to manage the impact.

4.3.3 Exposure

Exposure is the first action in assessing risk. Remember that exposure is the number of resources (personnel or equipment) affected by a given event or by repeated events over time. Exposure is the identification of the location of crops, livestock and farm holdings that may be directly impacted by the hazard. Interdependency in the supply chain leads to indirect exposure for other parties. Exposure can be expressed in the following terms:

- **Time** - how long resources are exposed to the hazard?
- **Proximity** - how close to resources would the hazard occur?
- **Volume** - the number of resources affected by the hazard?
- **Repetition** - the frequency with which the hazard would recur?

Although exposure is a component of risk, it is not used directly in assigning a level of risk. However, you should consider the exposure potential when assigning levels of probability and severity.

Clearly, this process of risk assessment involves the use of a number of assumptions and variables, so risk modelling is increasingly used as a tool to allow the development of probability estimates for financial losses. It should be noted that agricultural risk assessment is particularly dependent on the relationship between the timing of the loss event and the agricultural calendar. This is largely due to the fact that crop or livestock vulnerability varies according to the growth stage and season. In addition, risk assessment in agriculture is further complicated by the fact that vulnerability is heavily influenced by many local variables, such as soil, crop varieties, cultural practices, irrigation and drainage. The use of and access to local knowledge and information is therefore essential to the interpretation of agricultural risk within a given area.

4.4 Potential Severity of Impact of Risk

Basically, in the assessment of risks it is important to engage in the best approach to decisions in order to properly plan for the implementation of the risk management plan. Herein is the essence of best educated opinions and available statistics as the primary sources of information. The basic difficulty in risk assessment is the determination of the rate of occurrence because of the fact that statistical information is not available on all kinds of past incidents of risks. In addition, evaluating the severity of the impact or consequences is often quite difficult in terms of intangible assets.

The valuation of assets, generally, possesses some issue that needs to be resolved in risk assessment. Essentially, risk assessment is normally meant to produce information for the management of the organisation. It is obvious that such information will indicate that the primary risks of operations are easy to understand. The information produced from risk evaluation will also allow for the risk management decisions to be prioritised. There have been several theories and attempts to quantify risks. Perhaps the most widely accepted formula for risk quantification among the numerous different risk formulae is expressed below.

Risk Magnitude = Rate (or probability) of Occurrence x Impact of the Event.

4.4.1 Composite Risk Index

For the composite risk index, the above formula can also be used by re-writing it as follows:

Composite Risk Index = Impact of Risk event x Probability of Occurrence

The impact of the risk event is commonly assessed on a scale of 1 to 5, where 1 and 5 is the minimum and maximum possible impact of an occurrence of a risk. The impact of the risk is usually expressed in terms of financial losses. However, the 1 to 5 scale can be arbitrary and need not be on a linear scale given the fact that financial terms are used for the losses. Just like the impact of risk, the probability of occurrence is likewise commonly assessed on a scale from 1 to 5, where 1 represents a very low probability of the risk event actually occurring while 5 represents a very high probability of occurrence.

This alignment may be expressed in either mathematical term such as; event occurs once a year, once in ten years, once in 100 years etc. Alternatively, it may be expressed in narrative form such as; event has occurred here very often, event has been known to occur here, event has been known to occur in the industry etc. Basically, the 1 to 5 scale can be linear or non-linear depending on decisions or approaches as decided by the subject-matter experts in the field of risk assessment. The Composite Index thus can take values ranging typically, from 1 through 25, and this range is usually arbitrarily separated into three sub-ranges.

The overall risk assessment is then categorised as Low, Medium or High; all depending on the sub-range containing the calculated value of the Composite Index. For instance, the three sub-ranges could be defined as 1 to 10, 11 to 20 and 21 to 30.

Generally, the probability of risk occurrence is difficult to estimate. This is because the past data on frequencies are not readily available, as indicated earlier in this discussion. Similarly, the impact of the risk is not easy to estimate since it is often difficult to estimate the potential loss in the event of risk occurrence. Further, the above factors can change in magnitude depending on the adequacy of risk avoidance and prevention measures instituted by the organisation. It is also due to changes in the external business environment. The above reasons imply that it is critically necessary for the risk manager to periodically reassess risks and intensify or relax mitigation measures as the case may demand. Similarly, changes in environmental variables such as procedures, technology, schedules, budgets, market conditions, political environment will typically call for reassessment of risks.

Self-Assessment Exercises

1. Distinguish between vulnerability and exposure.
2. Explain how to measure variability of outcomes.

4.5 Elements of Decision Making under Risk

Decision making under risk involves probabilities, measures of variability, expected values and expectations. Many farmers utilise these concepts, often without recognising them. The following sections are designed to help farmers recognise and understand these elements of their decision making.

Crop yields and annual average prices received by farmers, as well as many other economic outcomes, occur much like the normal curve distribution. The average value tends to be the most frequent outcome, and the pessimistic and optimistic values are much less frequent. Whether outcomes exactly follow the normal curve is relatively unimportant. In decision making, we need to remember that yields or prices which are near the average are much more frequent (more likely) than either very high or very low prices or yields.

4.6 Measuring Variability

Variability of outcomes is generally associated with risk, and typically riskier situations have greater variability of outcomes. The average outcome is the most frequent or most likely if outcomes are normally distributed, but the average does not provide information about variability. The range-the highest and lowest values-combined with the average does provide some information about variability. However, it is difficult to make comparisons of variability between crops or prices. The coefficient of variation is a statistical measure of variability based on all of the values for yields or prices, not just the high, low and average. The coefficients of variation can be used to make comparisons of variability among crop yields or prices; the lower the coefficient of variation, the lower the variability. For example, assume corn yields averaged 1100Kg per hectare with a coefficient of variation of 15.0 percent. For soybeans, yields average 350Kg per hectare with a coefficient of variation of 10.0 percent.

In this example, soybean yields are relatively less variable from year to year than corn, as indicated by the smaller coefficient of variation. Furthermore, if yields are distributed like the normal curve, two thirds of the time soybean yields would be expected to fall within plus or minus 10 percent of 350Kg. Two thirds of the time soybean yields would be expected to be in the 315 to 385Kg per hectare range. In contrast, for corn, the range is plus or minus 15 percent or from 935 to 1265 kilogram per hectare. About one sixth of the time yields would be below these lower levels and about one sixth of the time above. Thus, optimistic outcomes, corn yields of over 1265 kilogram per hectare or 385 kilogram of soybeans per hectare or more, would be expected one year in six. Pessimistic outcomes, yields below 315 and 935 kilogram per hectare for soybeans and corn, would also be expected to occur one year in six.

4.7 Computing Expected Values

Many people make these comparisons every day without recognising the formal framework involved. The expected value is a mathematically derived value which weights the outcomes by their respective probabilities. Computing the expected value is a means of assigning a value to a risky alternative.

What is the expected value of a ticket in a raffle with 10,000 tickets and a prize worth ₦25,000? Because 9,999 tickets do not win the prize and only one does, we can compute the expected value of a ticket as:

$$\begin{array}{rcl}
 \text{₦}0 & \times & .9999 & = & 0 \\
 \text{₦}25,000 & \times & .0001 & = & 2.50 \\
 & & & & \text{-----} \\
 & & & & \text{₦} 2.50
 \end{array}$$

In this case, the number of tickets and the prize are both known with certainty. Whether an individual buys a raffle ticket with an expected value of ₦2.50 for ₦2.50 depends on one's attitude toward risk in this situation. A risk averse individual would not buy the ticket, but a risk preferer would be willing to pay more than ₦2.50. (Even a risk avoider may buy a raffle ticket with an expected value of ₦2.50 for \$5.00 if sold by a charitable organisation, but risk concerns are unimportant in this situation.)

In other situations, the probabilities and/or the outcomes may not be known with certainty. In this case, individuals typically use their expectations about the future to determine expected values. For example, assume that enterprise "A" is "most likely" to give a net return of ₦50 per hectare. An "optimistic" estimate of net returns is ₦150, and a "pessimistic" estimate is a loss of ₦100 per acre. If the optimistic and pessimistic outcomes each occur one year in six, the expected value of enterprise A can be computed as:

$$\begin{array}{rcl}
 \text{₦}150 & \times & 1/6 & = & \text{₦}25.00 \\
 50 & \times & 4/6 & = & 33.33 \\
 -100 & \times & 1/6 & = & -16.67 \\
 & & & & \text{-----} \\
 & & & & \text{₦}41.66
 \end{array}$$

Note that the probabilities 1/6, 4/6, and 1/6 sum to one. All of the outcomes which could occur have been accounted for in estimating the expected value.

An alternative enterprise, "B," may have a "most likely" net return of ₦40 per hectare. The "optimistic" and "pessimistic" estimates of net returns are

₦90 and ₦20 per hectare respectively. Assuming the same probabilities of outcomes for enterprises A and B, the expected value of enterprise B can be calculated as:

$$\begin{array}{rcl}
 90 \times 1/6 & = & \text{₦}15.00 \\
 40 \times 4/6 & = & 26.67 \\
 0 \times 1/6 & = & -3.33 \\
 & & \text{-----} \\
 & & \text{₦}45.00
 \end{array}$$

In these examples, the expected value of enterprise B is greater than that of enterprise A. Although the estimates of the most likely and optimistic estimates of returns for enterprise A are higher than for enterprise B, this is more than offset by the differences in the pessimistic returns. In this situation, with other things being equal, most decision makers would prefer enterprise B.

The expected value of an alternative is affected by estimates of both probabilities and net returns. The two calculations below indicate different assumptions for enterprise A. In the first, it is assumed that the optimistic returns will occur 2 years in 6 and the most likely 3 years in 6. In the second, it is assumed that the most likely return is ₦75 instead of ₦50 with the same probabilities as in the original example. The expected values are:

Calculation 1	Calculation 2
150 x 2/6 = \$50.00	₦150 x 1/6 = \$25.00
50 x 3/6 = 25.00	75 x 4/6 = 50.00
-100 x 1/6 = -16.67	-100 x 1/6 = -16.67
<u>₦58.33</u>	<u>₦58.33</u>

The expected values in both calculations are the same and are higher than the expected value for enterprise B.

Although computing an expected value of an alternative is a mathematically precise procedure, individuals may have different expected values for the same alternative. This occurs because people differ in their assessments of both the outcomes which may occur and the probabilities with which they may occur. Very few individuals will routinely compute the mathematically expected value, but the concept is useful in decision making because both the range and probability of possible outcomes are considered.

4.8 Summary

Risk measurement requires risk assessment. Risks are assessed on the basis of three variables namely, hazard, severity and exposure. Risk can be

measured by multiplying probability of occurrence with risk impact. An accurate farm record with respect to risk occurrence is a necessary tool in assigning the probability and risk impacts in terms of financial losses.

In this unit, you have learnt about risk measurement, severity of risk, variability measurement and expected values computation.

4.9 References/Further Readings/Web Resources

World Bank. (2005). *Agriculture Investment Sourcebook. Module 11: Managing Agricultural Risk, Vulnerability, and Disaster*. Washington, DC.

4.10 Possible Answers to Self-Assessment Exercise(s)

- 1. Vulnerability:** Is an estimation of what the impact of the realised risk would be given the assets affected by the event and taking into account the current ability to manage the impact.

Exposure: Exposure is the first action in assessing risk. Remember that exposure is the number of resources (personnel or equipment) affected by a given event or by repeated events over time. Exposure is the identification of the location of crops, livestock, and farm holdings that may be directly impacted by the hazard. Interdependency in the supply chain leads to indirect exposure for other parties. Exposure can be expressed in the following terms: Exposure is the first action in assessing risk. Remember that exposure is the number of resources (personnel or equipment) affected by a given event or by repeated events over time. Exposure is the identification of the location of crops, livestock, and farm holdings that may be directly impacted by the hazard. Interdependency in the supply chain leads to indirect exposure for other parties.
- 2. Measuring Variability:** Variability of outcomes is generally associated with risk, and typically riskier situations have greater variability of outcomes. The average outcome is the most frequent or most likely if outcomes are normally distributed, but the average does not provide information about variability. The range-the highest and lowest values-combined with the average does provide some information about variability. However, it is difficult to make comparisons of variability between crops or prices. The coefficient of variation is a statistical measure of variability based on all of the values for yields or prices, not just the high, low, and average. The coefficients of variation can be used to make comparisons of variability among crop yields or prices, the lower the coefficient of variation, the lower the variability.

MODULE 9 AGRICULTURAL MARKETING

Unit 1	Agricultural Marketing
Unit 2	Market
Unit 3	Marketing Functions
Unit 4	Marketing Surplus
Unit 5	Marketing Channels

Unit 1 **Agricultural Marketing**

Unit Structure

- 1.1 Introduction
- 1.2 Intended Learning Outcomes
- 1.3 Concept and Definition of Agricultural Marketing
- 1.4 Objectives of Agricultural Marketing
- 1.5 Importance of Agricultural Marketing
- 1.6 Problems of Agricultural Marketing
- 1.7 Summary
- 1.8 References/Further Readings/Web Resources
- 1.9 Possible Answers to Self-Assessment Exercise(s)

1.1 Introduction

Agricultural Marketing: Marketing is critical to better performance in agriculture as farming itself. Therefore, market reforms to be an integral part of any policy for agricultural development. A considerable progress has been achieved in technological improvements in agriculture by the use of high yielding varieties and chemical fertilizer. Agricultural marketing was till recently not fully accepted as a credential element in agricultural development in Nigeria. It occupies a fairly low place in agricultural development countries.

1.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- describe the concept of agricultural marketing
- explain the objective and importance of agricultural marketing
- discuss the important problems emerging from agricultural marketing and ways of tackling them.

1.3 Concept and Definition of Agricultural Marketing

Agricultural marketing is concerned with the marketing of farm products produced by farmers and of farm inputs required by them in the production of these farm products. Thus, the subject of agricultural marketing includes product marketing as well as input marketing. Agricultural marketing includes marketing functions, agencies, channels, efficiency and costs, price spread and market integration, producer's surplus, government policy and research, training and statistics on agricultural marketing. The term agricultural marketing is composed of two words; agriculture and marketing. **Agriculture** means activities aimed at the use of natural resources for human welfare i.e. all primary activities of production. **Marketing** connects a series of activities involved in moving the goods from the point of production to the point of consumption. It includes all the activities involved in the creation of time, place, form and possession utility. **Form utility** is implanted to commodity through processing. **Time utility** is added to commodity by the storage function. **Place utility** creates through transportation services as which when commodities are transferred from one person to another in marketing channel through buying and selling activities, **Possession utility** is imparted.

1.4 Objective of Agricultural Marketing

The objective of the field of marketing can be examined from four angles viz. producers' interest, consumers' interest, traders' interest and government role.

Farmers' Interest: Farmers want the marketing system to purchase their produce without loss of time and provide maximum share in the consumer's rupee. They want to get input at cheaper rate and get higher price for their products.

Consumers' Interest: Interest of consumers in a marketing system that can provide food and other items in the quantity and of the quality required by them at the lowest possible price.

Traders' interest: They are interested in marketing system which provides them a steady and increasing income from the purchase and sale of agricultural commodities. It is possible if they purchase at lower price from farmers and sell at higher price.

Government: The above three groups are indispensable to society. The Government has to act as watchdog to safeguard the interest of all the groups associated in marketing. They always wish to bring over welfare to all the segments of society.

Agricultural Marketing is concerned with the marketing of farm products and of farm inputs and services required by them in the production of farm product. Thus, the subject of agricultural marketing includes product marketing as well as input marketing.

As marketable surplus of the crops and other agricultural commodities increase, output marketing becomes more conspicuous. Therefore, the market orientation of farming has increased.

Farmers in the past used farm sector inputs as local seeds and farm yard measure. Nowadays, the importance of farm inputs-improved seeds, fertilizers, insecticides, implements and credit in the production of farm products has increased. The new agricultural technology is input - responsive. Thus, the scopes of agricultural marketing must include both product marketing and input marketing.

The subject matter of agricultural marketing has been dealt with both from the theoretical and practical point of view. It covers what the system is, how it functions, and how the given methods or techniques may be modified to get the maximum benefits.

1.5 Importance of Agricultural Marketing

Agricultural marketing plays an important role not only in stimulating production and consumption, but in accelerating the pace of economic development.

The technological breakthrough has led to a substantial increase in production and consumption through technological development, an assurance of remunerative price to the farmer is a prerequisite. This assurance can be given to the farmer by developing an efficient marketing system.

The importance of agricultural marketing in economic development has been indicated in the following paragraphs.

1. **Optimisation of resources use and output management:** An efficient marketing system can contribute to an increase in the marketable surplus by scaling down the losses arising out of inefficient processing, storage and transportation. A well-designed system of marketing can effectively distribute the available stock of modern inputs, and thereby sustain a faster rate of growth in the agricultural sector.
2. **Increase in farm income:** An efficient marketing system ensures higher level of income for the farmers by reducing the number of middlemen or restricting the commission on marketing services

and malpractices adopted by them. An efficient marketing system guarantees the farmers better prices of farm products and induces them to invest their surpluses in the purchase of modern inputs to increase the production.

3. **Widening of markets:** A well-knit marketing system widens the market for the products by taking them to areas far away from the production points. It helps in increasing the demand on a continuous basis, and thereby guarantees a higher income to the producer.
4. **Growth of agro-based industries:** An improved and efficient system of agricultural marketing helps in the growth of agro-based industries and stimulates the overall development of the economy.
5. **Price signals:** An efficient system helps the farmers in planning their production in accordance with the needs of economy. This work is carried out through price signals.
6. **Adoption and spread of new technology:** The marketing system helps the farmers in the adoption of new scientific and technological knowledge.
7. **Employment:** The marketing system provides employment to millions of persons engaged in various activities, such as packaging, transportation and processing. Persons like commission agents, brokers, retailers, weighmen and regular staff are employed in the marketing.
8. **Creation of utility:** Marketing adds costs to the product, but at the same time it adds utilities to the product. Four types of utilities are created by marketing.
 1. **Form utility:** The processing adds form utility to the product by changing the raw material into a more useful finished form; e.g. oil seeds are converted into oil, cotton into cloth.
 2. **Place utility:** Transportation adds place utility to products by shifting them to a place of need from the place of plenty.
 3. **Time utility:** The storage function adds time utility to the products by making them available at the time when they are needed.
 4. **Possession utility:** The marketing function - buying and selling helps in the transfer of ownership from one person to another.

Self-Assessment Exercises

1. Examine farmers' interest in agricultural marketing.
2. Explain price instability as a problem of agricultural marketing.

1.6 Problems of Agricultural Marketing

The Rapid development in the agricultural research and the introduction of technological innovation, viz., high yielding varieties, improved agricultural implements, fertilizers and pesticides in the recent past, have brought about a breakthrough in agriculture. This breakthrough popularly known as green/white/yellow/blue revolutions, has given rise to new problems in agricultural marketing. It is essential to maintain the tempo of these revolutions. The farmer should be assured of a fair price for their produce, failing which they may lose incentive to increase the agricultural production. There is an urgent need in the present context for tackling the emerging problems of agricultural marketing more resolutely and efficiently than ever before. The important problems which have emerged in the recent past pertain to the following areas:

(i) Increase in Production Levels and Market Arrivals

With the increased market arrivals, it is necessary that a large number of market yards should be developed in rural areas with all the necessary marketing facilities. Without spacious market yards, it is not possible to centralise and effectively supervise the transactions taking place in the area. The development of spacious market yards is also essential to perform various marketing functions such as, grading, cleaning, sieving and weighing of agriculture produce.

Presently, most of the markets do not have spacious market yards and transactions are carried out in congested areas in the centre of the city. Recently, some market committee constructed spacious market yards, but majority of market committees do not have them because of paucity of funds and non-availability of land.

(ii) Price Instability

Agricultural prices are very instable and fluctuate violently. These prices fall in the post-harvest months and increase later in the year. The increasing instability in agricultural prices adversely affects the income of farmers as well as the tempo of increasing production. There is, therefore, a need to reduce price instability. Several steps may be taken for farmer to get better share in consumer's money. Some of the steps to check the price instability are: fixation of minimum support price of the crops by the government, purchase of commodities if market price falls below that level and development of warehousing facilities to check post-harvest sales among the farmers.

(iii) Market Intelligence

Market intelligence is another problem that has emerged and is an important adjunct of orderly marketing. With the increased marketed surplus and opening up of trade, the importance of marketing intelligence has increased. Farmers market the produce in the village and nearby assembling market out of their ignorance of the price prevailing in the nearby primary wholesale, secondary wholesale and terminal markets. Traders take advantage of the ignorance of the farmer because they have full knowledge of prices prevailing in the market.

(iv) Marketing of Agricultural Inputs

The marketing procedure of agricultural inputs has to be improved. This is most essential in the present context of the use of new technology. The new-evolved HYV seeds are more responsive to other inputs, and arrangements for their timely availability are a prerequisite for the success of the programmes of agricultural development.

(v) Ancillary Facilities in the Market

The existing markets lack the ancillary facilities, like banks, post office, telegraph office and shopping centres. Also, the facilities of sorting, grading and packing in the villages or primary markets are not available. These should be increased to provide full benefits to the farmers.

(vi) Finance for Market Development

Market development with all the ancillary facilities is highly capital-intensive and returns on investment in it accrue slowly over a period of year. For market development, a special arrangement for financing is necessary.

(vii) Education of Farmers

It is equally necessary to educate the farmer in marketing of agricultural produce so that they may derive necessary benefits of their activities. Without proper education, benefits cannot reach to the farmers fully. These are more so in the present context with the availability of increased marketed surplus with producer-farmer.

(viii) Superfluous Middlemen

Since the farmer sells a substantial portion of his produce in the village and nearby markets, there is always intervention of a number of middlemen between him and the consumer and

naturally, the share of consumer's price received by the producers is reduced.

(ix) Inadequate Storage and Transportation Facilities

There is general inadequacy of good storage facilities both in rural and urban areas. The indigenous methods of storage adopted in the villages do not adequately protect the produce; as a result, physical loss goes on increasing if the period of storage is lengthened.

With the rise in production and marketed surplus, farmers and traders are faced with the problem of adequate and quick means of transportation of the produce at the village level, inter market and interstate level.

(x) Bulkiness and Perishability of the Produce

Compare to other products, agricultural products are bulkier in nature. Bulkiness affects marketing functions concerned, mostly with physical handling. Further, the products that occupy a lot of space in relation to their value automatically raise unit transportation and storage costs.

In relation to other products, agricultural products by nature are perishable. These perishable products require speedy handling and often special refrigeration which raises the cost of marketing.

1.7 Summary

In this unit, you have learnt:

- The concept and definition of Agricultural Marketing.
- The objective of Agricultural Marketing.
- Importance of Agricultural Marketing, and
- Problems of Agricultural Marketing.

1.8 References/Further Readings/Web Resources

Acharya, S.S & Agarwal, N.L (2006). *Agricultural Marketing in India*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Reddy, S.S., Ram, P.R., Sastry, T.V. N. & Devi, I.B. (2009). *Agricultural Economics*. (2nd ed.) New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

1.9 Possible Answers to Self-Assessment Exercise(s)

1.

Farmers' Interest: Farmers want the marketing system to purchase their produce without loss of time and provide maximum share in the consumer's money. They want to get input at cheaper rate and get higher price for their products.

2.Price Instability:

Agricultural prices are very instable and fluctuate violently. These prices fall in the post-harvest months and increase later in the year. The increasing instability in agricultural prices adversely affects the income of farmers as well as the tempo of increasing production. There is, therefore, a need to reduce the price instability. Several steps may be taken for farmer to get better share in consumer's money. Some of the steps to check the price instability are: fixation of minimum support price of the crops by the government, purchase of commodities if market price falls below that level and development of warehousing facilities to check post-harvest sales among the farmers.

Unit 2 Market

Unit Structure

- 2.1 Introduction
- 2.2 Intended Learning Outcomes
- 2.3 Market
- 2.4 Classification of Markets
 - 2.4.1 On the Basis of Location
 - 2.4.2 On the Basis of Area/Coverage
 - 2.4.3 On the Basis of Time
 - 2.4.4 On the Basis of Volume of Transactions
 - 2.4.5 On the Basis of Nature of Transaction
 - 2.4.6 On the Basis of Number of Commodities in which Transaction takes Place
 - 2.4.7 On the Basis of Degree of Competition
 - 2.4.8 On the Basis of Extent of Public Intervention
- 2.5 Summary
- 2.6 References/Further Readings/Web Resources
- 2.7 Possible Answers to Self-Assessment Exercise(s)

2.1 Introduction

A market exists when buyers wishing to exchange the money for a good or service are in contact with the sellers who are willing to exchange goods or services for money. Thus, a market is defined in terms of the existence of fundamental forces of supply and demand and is not necessarily confined to a particular geographical location. The concept of a market is basic to most of the contemporary economies, since in a free market economy, this is the mechanism by which resources are allocated.

2.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- define a market
- explain the classification of markets.

2.3 Market

A market is the area within which the forces of demand and supply converge to establish a single price.

The term 'market' does not mean a particular marketplace in which things are bought and sold, but the whole of any region in which buyers

and sellers are in such a free intercourse with one another that the prices of the same goods tend to equality, easily and quickly.

2.4 Classification of Markets

2.4.1 On the Basis of Location

- 1) **Village markets:** A market located in a small village where major transactions take place among the buyers and sellers of a village, is called a village market.
- 2) **Primary wholesale markets:** These markets are located in big towns near the production centres. In these markets, a major part of the produce is brought for sale by the farmers themselves. Transaction in these markets usually takes place between the farmers and traders.
- 3) **Secondary wholesales markets:** These markets are located generally at district headquarters or important trade centre of near railway junction. The major transactions in commodities take place between the village traders and wholesalers or between wholesaler's retailers. The bulk of the arrivals in these markets is from other markets. The produce is handled in large quantities and specialised operations become necessary for the performance of different services viz. storage, handling, banking, etc.
- 4) **Terminal markets:** A terminal market is one where the produce is either finally disposed of to the consumers or processors or assembled for export. Merchants are well organised and use modern methods of marketing. Such markets are usually at the ports, which possess sufficient warehousing and storage facilities and cover a very wide area extending over even a state or two.
- 5) **Seaboard markets:** These markets are located near the seashore and are meant mainly for the import/export of goods. Example, Bombay, Madras, Calcutta, etc.

2.4.2 On the Basis of Area/Coverage

Based on the area from which buyers and sellers usually come for transactions, market may be classified as:

1. **Local or village markets:** Buying and selling among the buyers and sellers are done from the same village or nearby villages. They exist mostly for perishable commodities in small lots, e.g. local milk market, vegetable market, etc.
2. **Regional markets:** A market in which buyers and sellers for a commodity are drawn from a larger area than the local markets.

For example, regional markets in India usually exist for food grains.

3. **National markets:** A market in which buyers and sellers are at the national level. National markets are found for durable goods like jute and tea.
4. **World markets:** A market in which the buyers and sellers are drawn from the whole world. These markets exist in the commodities which have a worldwide demand and/or supply, such as coffee, agricultural machinery, gold, etc.

2.4.3 On the Basis of Time

- a. **Short period markets:** These are held only for a few hours. The products dealt in these markets are of a highly perishable nature, such as fish, vegetables and milk. In these markets, the prices of commodities are governed by the extent of demand, rather than by the supply of the commodity.
- b. **Long period markets:** These are held for a longer period than the short period market; the commodities traded in these markets are less perishable and can be stored for some time. E.g. food grains and oilseeds.
- c. **Secular markets:** These are markets of a permanent nature. The commodities traded are durable in nature and can be stored for many years. For example, agricultural tools, machinery, fertilizer, etc.

2.4.4 On the Basis of Volume of Transactions

- a) **Wholesale markets:** A wholesale market is one in which commodities are bought and sold in large lots or in bulk. Transaction in these markets takes place mainly between traders.
- b) **Retail Markets:** A retail market is one in which commodities are bought and sold to the consumers as per their requirements. Transactions take place between retailers and consumers. The retailer purchases in wholesale markets and sell in small lots to the consumers. They are near to the consumers.

2.4.5 On the Basis of Nature of Transaction

- a. **Spots or cash markets:** These are markets in which goods are exchanged for money immediately after the sale.
- b. **Forward markets:** These are markets in which the purchase and sale of a commodity takes place at time 't' but the exchange of the commodity takes place on some specified date in future i.e. t +1. Sometimes the difference in the purchase and sale prices are paid or taken. For example, groundnut oil market.

2.4.6 On the Basis of Number of Commodities in which Transaction takes Place

- 1) **General market:** A market in which all types of commodities, such as food grains, oilseeds, fiber crops, gur, etc., are bought and sold is known as general markets.
- 2) **Specialised markets:** Here, for every group of commodities, separate markets exist. The examples are food grain markets, vegetable markets, wool market and cotton market.

2.4.7 On the Basis of Degree of Competition

1. **Perfect markets:** A perfect market is one in which the following conditions hold:
 - 1) There are large numbers of buyers and sellers.
 - 2) All the buyers and sellers in the market have perfect knowledge of demand, supply and prices.
 - 3) Prices at any one time are uniform over an area + or - the cost of transportation.
 - 4) The prices of different forms of a product are uniform + or - the cost of processing. Example, farm products, wheat, rice, bajra, cotton, etc.

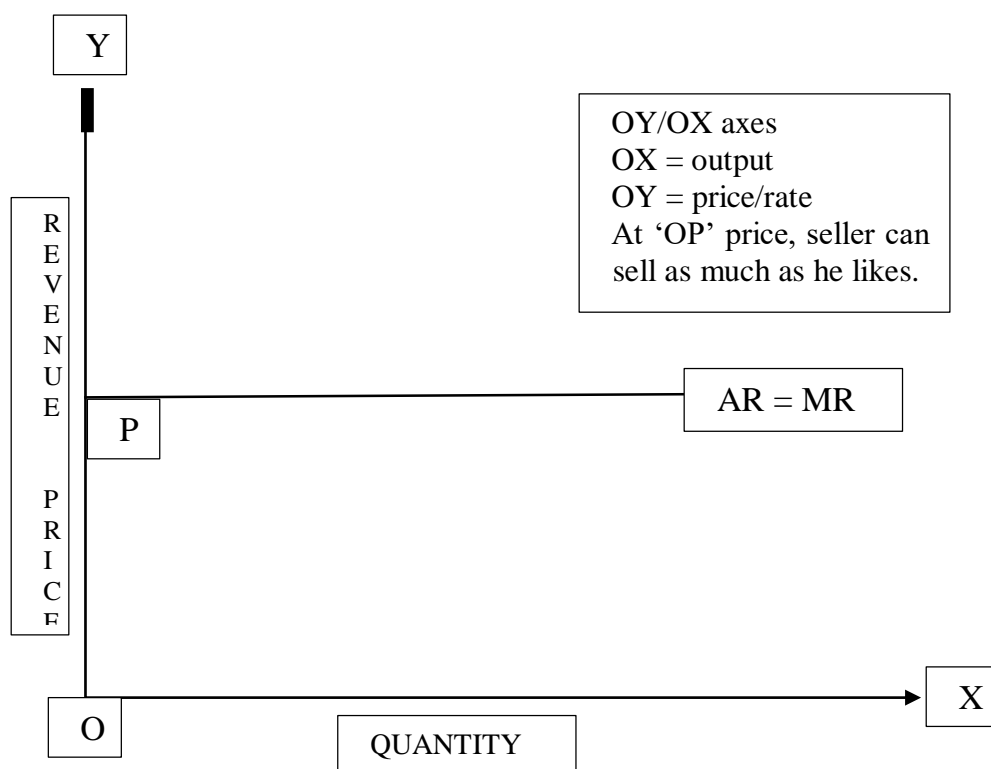


Figure 2.1: Average Revenue Curve or Sales Curve of a Firm under Perfect Competition

- Firms will be making just normal profit. In perfect competition, purchaser or seller is so small relative to the entire market that he cannot influence the market price by increasing or decreasing his purchases or his output. Thus, the prevalence of the same price for the same commodity at the same time is the essential characteristics of a perfect market.

(2) Imperfect competition:

A market is said to be imperfect when some buyers or sellers or both are not aware of the offer being made by others. Therefore, different prices prevail for the same commodity at the same time in an imperfect market

Imperfect competition is of three forms:

- (a) Monopolistic competition
- (b) Oligopoly
- (c) Monopoly

(a) Monopolistic competition:

When many sellers deal in heterogeneous and differentiated form of a commodity, the situation is called monopolistic competition.

Main features:

1. Number of sellers are not large.
2. Products are heterogeneous – different branded tractors.
3. Either in ignorance or on account of transportation cost or lack of mobility of the factors of production, same price does not rule.
4. AR or MR or price curve is not horizontal but downward.
5. Demand for the product is not perfectly elastic; it is responsive to changes in price. The products are not complete substitutes for one another, but they are close substitutes.

(b) Oligopoly: (perfect oligopoly and imperfect oligopoly)

A market in which there are more than two but still a few sellers of a commodity is termed as an oligopoly market. A market having a few (more than two) buyers is known as oligopsony market, e.g. toothpaste producers.

In perfect oligopoly, commodity is homogenous.

In imperfect oligopoly, commodity is heterogeneous.

(c) Monopoly:

Monopoly is a market situation in which there is only one seller of a commodity. The price of a commodity is generally higher than in other markets. Indian farmers operate in monopoly market when purchasing electricity for irrigation. When there is only one buyer of a product the market is termed as a **monopsony market**.

There are no substitutes for his product. He controls the entire supply and he can fix the price. In monopoly, there is no need to differentiate products because no close substitutes are available. It is one product, homogenous and completely under the control of the monopolist. Average revenue is the revenue per unit of the commodity sold. The average revenue (AR) curve (or demand curve) always slopes downwards to the right as in monopoly competition, but it is less elastic in monopoly than in monopolistic competition.

Table 2.1: Total, Average and Marginal Revenue Schedules

No. of unit sold	Price or Average Revenue	Total Revenue AR x quantity sold	Marginal Revenue (addition made to total revenue.)	
1	22	22	22	-
2	21	42	20	(42-22)
3	20	60	18	(60-42)
4	19	76	16	(76-60)
5	18	90	14	(90-76)
6	17	102	12	(102-90)
7	16	112	10	(112-102)
8	15	120	8	(120-112)
9	14	126	6	(126-120)
10	13	130	4	(130-126)

$$AR = \frac{\text{Total Revenue}}{\text{No. of Unit Sold}}$$

Average revenue (AR) curve of the firm is really the same thing as demand curve of the consumer.

On the other hand, marginal revenue at any level of firm's output is the net revenue earned by selling another (additional) unit of the product.

The MR can also be directly found by taking out the difference between the total revenues before and after selling the additional unit.

MR= Difference in total revenue in increasing the sales from n-1 to n units

(i) Total revenue = price x quantity i.e. $TR = P \times Q$

(ii) Average Revenue = $\frac{\text{Total Revenue}}{\text{Quantity}}$

$$AR = \frac{TR}{Q}$$

$$(iii) \text{ Marginal Revenue} = \frac{\text{Change in total revenue}}{\text{Change in quantity}}$$

$$MR = \frac{\Delta TR}{\Delta Q}$$

By converting the schedules of AR given in the table alongside into curves, we get two downward sloping curves and find that marginal revenue curve is below average revenue curve, because a falling price must mean some loss on the sale of additional supply. When competition is perfect, the average revenue curve of the firm is a horizontal straight line, because additional units are sold at the same price as before.

- 3) **Imperfect markets:** The markets in which the conditions of perfect competition are lacking are known as imperfect markets. They may be:
 - 1) **Monopoly market:** A market situation in which there is only one seller of a commodity. He has sole control over the supply or price of a commodity. The price of commodity is generally higher than in other markets. Indian farmers operate in monopoly market when purchasing electricity for irrigation. When there is only one buyer it is termed as a monopsony market.
 - 2) **Duopoly market:** A duopoly market is one which has only two sellers of commodity. They mutually agree to charge a common price which is higher than the price in a perfect market. Example, fertilizer companies
 - 3) **Oligopoly market:** A market in which there are more than two but still a few sellers of a commodity is termed as oligopoly market. Example, insecticide/pesticide companies
 - 4) **Monopolistic competition:** When many sellers deal in heterogeneous and differentiated forms of a commodity, it is called monopolistic market. The difference is made conspicuous by different trademarks on the product. Different prices prevail for the same basic product. For example, farmers have to choose between various makes of insecticides, fertilizers and equipment.

2.4.8 On the Basis of Extent of Public Intervention

1. **Regulated markets:** Markets in which business is done in accordance with the rules and regulations framed for market organisation and represent different sections involved in markets. The marketing costs in such markets are standardised and practices are regulated.
2. **Unregulated markets:** These are the markets in which business is conducted without any set rules and regulations. Traders frame

the rules for the conduct of the business and run the market. These markets suffer from many ills, such as unauthorised charge for marketing functions.

Self-Assessment Exercises

1. What are the bases on which market is classified?
2. Differentiate between oligopoly and monopoly.

2.5 Summary

You learnt what market is all about and the bases in which it is being classified.

In this unit, you have learnt that:

- A market is the area within which the forces of demand and supply converge to establish a single price.
- Market is classified on the bases of the following: location, area/coverage, time, volume of transaction, nature of transaction, number of commodities, degree of competition and extend of public intervention.

2.6 References/Further Readings/Web Resources

Acharya, S.S. & Agarwal, N.L. (2006). *Agricultural Marketing in India*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Reddy, S.S., Ram, P.R., Sastry, T.V.N. & Devi, I.B. (2009). *Agricultural Economics*, (2nd ed.). New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

2.7 Possible Answers to Self-Assessment Exercise(s)

1. On the basis of:

1. location
2. area/coverage
3. time
4. volume of transactions
5. nature of transaction
6. number of commodities in which transaction takes place
7. degree of competition
8. extent of public intervention.

- 2. Oligopoly market:** A market in which there are more than two but still a few sellers of a commodity is termed as oligopoly market. Example, insecticide/pesticide companies.

Monopolistic competition: When many sellers deal in heterogeneous and differentiated form of a commodity, it is called monopolistic market. The difference is made conspicuous by different trademarks on the product. Different prices prevail for the same basic product. For example, farmers have to choose between various makes of insecticides, fertilizers and equipment.

Unit 3 Marketing Function

Unit Structure

- 3.1 Introduction
- 3.2 Intended Learning Outcomes
- 3.3 Marketing Function
- 3.4 Classification of Marketing Function
 - 3.4.1 Primary Functions
 - 3.4.2 Secondary Functions
- 3.5 Summary
- 3.6 References/Further Readings/Web Resources
- 3.7 Possible Answers to Self-Assessment Exercise(s)

3.1 Introduction

You have thus far learnt about marketing and market. This unit is about marketing function.

3.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain marketing function
- explain the classification of marketing function.

3.3 Marketing Function

Marketing function is an act, operation or service by which the original producer and the final consumer are linked together.

With the marketing system getting more complex, there arises the need for number of new functions. It includes all the functions and processes involved in the movement of the produce from farmers to the consumers. Number of functions is involved in marketing of farm product. Neither the producers nor the consumers of farm products are located at one place. They are spread all over the country.

3.4 Classification of Marketing Function

The marketing function may be classified in various ways. **Thompson** has classified the marketing functions into three broad groups. These are:

Table 3.1: Classification of Marketing Function

1. Primary functions	a) Assembling or procurement b) Processing (preparation for consumption) c) Dispersion or distribution
2. Secondary functions	a) Packing or packaging b) Transportation c) Grading, standardisation and quality control d) Price determination or discovery e) Risk taking f) Financing g) Buying and selling h) Demand and creation i) Dissemination of market information
3. Tertiary functions	a) Banking b) Insurance c) Communication (post and telegraph) d) Supply of energy (electricity)

3.4.1 Primary Functions

a) Assembling:

In agriculture, the goods are mostly produced by small farmers, scattered over a wide area. Collection of small quantities from them, before further processes of marketing are undertaken, is necessary. Assembling therefore means bringing together, collecting and concentrating goods of the same type from the various sources of supply at centrally located places.

Advantages:

- 1) Economy in transportation
- 2) Availability of goods in large quantity
- 3) Widen the markets
- 4) Grading is possible
- 5) Processing can be done economically.

b) Processing:

We find very few agricultural products at farm level which are ready for final consumption. In most cases, **marketing system** must convert them into suitable forms before they can be disposed to consumers. Also, when there is excess farm production, it poses a serious problem of surplus. Processing can help to convert this surplus into durable items and creates new demand. **Processing is defined as the act or series of acts by which a product is converted into a more usable form.**

c) Dispersion:

Dispersion is a process exactly opposite to that of assembling. After collecting the products of many farmers at different localities and processing the same, the process of dispersion begins. Dispersing function involves finding where potential buyers are located, how much and what products they prefer and what price they are ready to offer. It also includes selling of the goods, their physical movement and handling, transfer of funds back to central and assembling markets. From the major wholesale markets, the process of dispersion starts. It is seen through various marketing channels.

3.4.2 Secondary Functions:

These are the facilitative functions which are essential for smooth running of main functions viz, assembling, processing and dispersion.

1) Packing and packaging:

Packing is the first function performed in the marketing of agricultural commodities. It is required for nearly all farm products at every stage of marketing process. The type of the container used in the packing of commodities varies with the type of the commodity as well as with the stage of marketing. **Packing** means the wrapping and carting of goods before they are transported.

Packing is done for (Advantages):

a) Facilitating handling **(b)** reducing freight **(c)** reducing storage and handling cost **(d)** preventing deterioration and loss by damage **(e)** making produces more attractive **f)** enabling consumers to buy in convenient units **(g)** broadening of markets **(h)** prolong storage life.

2) Transportation:

Transportation is one of the most important functions of the agricultural marketing system because of bulky and perishable nature of agricultural produces. Normally, the produce is moved from the farm to the assembling centre, from farm to the urban market and to the consuming centre. All forms of transportation; rail, air and water are used in moving the produce from the farm to its ultimate destination. Efficiency in transport depends upon the speed with which the goods are delivered and care taken during transit. Transportations create place utility.

Advantages:

- 1) Widening of the market.
- 2) Narrowing price difference over space.
- 3) Creation of employment.

- 4) Facilitation of specialised farming.
- 5) Transformation of economy.
- 6) Mobility of the factors of production like capital and labour.
- 7) It helps in development of markets.
- 8) Reduction in spatial price differences.

3) Grading and standardisation:

Agricultural produces differ in size, color, quality and nutritive value; to take into consideration these aspects, agricultural produce is standardised, e.g. food grains are graded as coarse and fine. Standardisation means to determine the classes or grades of product or services. Grading is the process of sorting individual specimen of a given product to the standard grades of classes to which they belong. Grading is done for getting better prices.

4) Storage and Warehousing

Agricultural produce is of seasonal nature, it is produced at a particular point of time. However, demand for agricultural produce is constant throughout the years. This characteristic increases importance of storing.

Storage is an exercise of human foresight by means of which commodities are protected from deterioration and surplus products are stored for release in future scarcity to get the better prices.

Warehousing: Warehouses are scientific storage structures especially constructed for the protection of the quantity and quality of stored products. Warehousing may be defined as the assumption of responsibility for the storage of goods. It may be called the protector of national wealth. The warehousing scheme in India is an integrated scheme of scientific storage, rural credit, price stabilisation and market intelligence and is intended to supplement the offers of co-operating institutions. The important functions of warehousing are: (1) scientific storage (2) financing (3) price stabilisation (4) market intelligence, etc.

5) Price determination and price discovery:

Under the marketing system, there is the responsibility of realising the value of the goods delivered to the final consumers and distributing it to various marketing products at each stage as they move through the marketing channels. Prices are determined by the aggregate forces of demand and supply in a market, while prices are discovered at each stage in the marketing channel. Price is discovered in an individual market by retailer and

consumers, whereas price determination takes place in the total market by the forces of demand and supply.

6) Risk taking and risk bearing:

There is always a time lag between the harvesting and final consumption. Risk is imminent under such a situation and this is borne by the producers, traders and others involved in marketing process.

Hardy has defined risk as uncertainly about cost, loss or damage. Risk bearing ability means ability to withstand losses or adverse conditions faced while carrying out various marketing functions. There is risk of losses due to fire, flood, famine, rodents, quality deterioration, price fall, change in taste, habit or fashions etc. There are three types.

- (i) **Physical risk:** This is caused during weighting, bagging, transportation, storage, etc. It consists of loss of quantity.
- (ii) **Price risk:** Because of the special characteristics of agricultural products, price risk is a common phenomenon. Price fluctuation during the same day, from week to week from month to month and year to year.
- (iii) **Institutional risk:** Government policies like movement restrictions of food grains, imposition of levies, etc. bring losses to the markets. It reduces by improving storage structures, insurance and market information.

7) Financing: Money or credit is an important means to carry out various marketing functions. The financing function of marketing involves the use of capital to meet the financial requirements of agencies engaged in various marketing activities. A farm product takes time for goods to reach into the hands of the ultimate consumers. Therefore, it needs the service of providing the credit and money to meet the cost of selling merchandise into the hands of the final users. This is commonly referred to as the finance functions in market.

8) Buying and selling: Buying and selling are the most important activities in the marketing process. The buying activity involves the purchase of right goods at the right place, at the right time, at the right price and in the right quantity. Selling is one of the dispersing functions. Selling in business would mean the transfer of ownership of goods or services to a buyer in exchange for money. Selling consists of sub-functions viz: product planning and development, contractual function, demand creation and the function of negotiation. Selling occurs at various stages, initially

farmer sells to village merchant or to a merchant in a regulated market, again wholesale merchant sells produce to retailer and retailer sells to consumers.

Self-Assessment Exercises

1. What is dispersion function?
2. List the common methods which may be used to create a demand for products.

Methods of selling:

- i. **Under cover of a cloth (hatha system):** Price is fixed between buyer and commission agent by pressing the fingers of each other. Seller does not have to be aware about price settle between buyer and commission agent.
- ii. **Private negotiations:** Direct contact between the buyer and sellers. The seller meets the buyer with a sample of the produce. The buyer quotes the price and if satisfied, then deal is completed.
- iii. **Quotation on samples:** In this method, commission agents approach the buyers with the sample and who offered the highest price per unit of the produces.
- iv. **Dara sale method:** By this method, the produce in different lots is mixed and then sold at one lot. The advantage of this method is that, within a short time, a large number of lots are sold off.
- v. **Moghum sale method:** In this method, harvest price is the selling price. It is a common method of sale found in villages when the farmers borrow funds from the local moneylenders.
- vi. **Open auction method:** It prevails in most of the regulated markets. The prospective buyers examine the lots of the produce kept for sale and offer their bids openly. Highest bidder has the right to take the possession of the commodity and amount is settled immediately after the sale.
- vii. **Close tender system:** This is the same as that of the open auction system except that the bids are offered in the form of closed tenders. Considering the lots of produce, buyers offer their price on a slip of paper and put in a sealed box. Highest bidder has the right to take the possession of the produce in a lot.

9. Dissemination of market information function:

Market information is an important marketing function which ensures the smooth and efficient operation of the marketing system. Accurate, adequate and timely availability of market information facilitates decision about where and when to market

product. Market information is published by trader's organisation or by individual firm in the form of publication of daily, weekly, market reports, news bulletins, monthly journals, etc. Market intelligence is a continuous study of market behaviors and price situation. Market news provides current information about prices, arrivals and change in market conditions.

10. Demand creation:

It includes all the special efforts that are made to stimulate the desire of goods of prospective buyers with the ultimate objective of sale at a profit. Some of the common methods which may be used to create a demand for the products are:

- i. Personal contact by salesman
- ii. Advertisement
- iii. Display of goods in stores, railway stations etc.
- iv. Arranging trade fairs, exhibition
- v. Distribution of free samples
- vi. Offers of various types of facilities.

These practices used in the creation of demand add to the cost of marketing.

3.5 Summary

This unit discussed marketing function and classification of marketing functions.

You have learnt that marketing function is an act, operation or service by which the original producer and the final consumer are linked together.

3.6 References/Further Readings/Web Resources

Acharya, S.S. & Agarwal, N.L. (2006). *Agricultural Marketing in India*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Reddy, S.S., Ram, P.R., Sastry, T.V.N. & Devi, I.B. (2009). *Agricultural Economics*, (2nd ed.). New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

3.7 Possible Answers to Self-Assessment Exercise(s)

1.

Dispersing function involves finding where potential buyers are located, how much and what products they prefer and what price they are ready to offer. It also includes selling of the goods, their physical movement and handling, transfer of funds back to central and assembling markets. From the major wholesale markets the process of dispersion starts. It is seen through various marketing channels.

2. Some of the common methods which may be used to create a demand for the products are:

- i. Personal contact by salesman
- ii. Advertisement
- iii. Display of goods in stores, railway stations etc.
- iv. Arranging trade fairs, exhibition
- v. Distribution of free samples
- vi. Offers of various types of facilities.

Unit 4 Marketing Surplus

Unit Structure

- 4.1 Introduction
- 4.2 Intended Learning Outcomes
- 4.3 Marketing Margins
- 4.4 Concepts of Marketing Margins
- 4.5 Marketable Surplus
- 4.6 Factors Affecting Marketable Surplus
- 4.7 Summary
- 4.8 References/Further Readings/Web Resources
- 4.9 Possible Answers to Self-Assessment Exercise(s)

4.1 Introduction

Producer surplus is a measure of **producer welfare**. It is measured as the difference between what producers are willing and able to supply a good for and the price they actually receive.

4.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- explain marketing margins
- describe marketable surplus
- list the factors affecting marketable surplus.

4.3 Marketing Margins

In the marketing of agricultural commodities, the difference between the price paid by consumer and the price received by the producer for an equivalent quantity of farm produce is often known as price spread. Sometimes, this is termed as marketing margin. The total margins include:

- 1) the cost of marketing functions, and
- 2) profits of the various market functionaries involved in moving the produce from production to ultimate consumer.

Marketing margin varies from channel to channel, market to market, time, and commodity to commodity.

4.4 Concepts of Marketing Margins

- 1) **Concurrent margins:** These refer to the difference between the prices prevailing at successive stages of marketing at a given

point of time. For example, the difference between the farmers' selling price and retail price on a specific date is the total concurrent margin. It does not take into account the time that elapse between the purchase and sale of the produce.

- 2) **Lagged margin:** It is the difference between the prices received by a seller at a particular stage of marketing during an earlier period. It is a 'between concept' because it takes into account the time that elapses between the purchase and sale by a party and between the sale by the farmer and the purchase by the consumer.

4.5 Marketable Surplus

It is the residual left with the producer farmer after meeting his requirements for family consumption, farm needs for seeds and feed for cattle, payment to labourer in kind, payment to landlord as rent and social and religious payments in kind. This may be expressed as:

$$MS = P - C$$

Where:

MS = Marketable surplus

P= Total production

C= Total requirements

Marketed surplus: It is that quantity of the produce which the producer-farmer actually sells in the market, irrespective of his requirements for family consumption, farm needs and other payments.

Relationship:

- 1) **Marketable surplus < Marketed surplus**
i.e. Forced sale OR Distressed sale
When the farmer retains a smaller quantity of the produce than his actual requirements for family and from needs.
- 2) **Marketable surplus > marketed surplus**
When farmers retain some of the surplus produce. Large farmers generally sell less than the marketable surplus because of their better retention capacity and in the hope that they would get a higher price in the later period.
- 3) **Marketable surplus = marketed surplus**
When a farmer neither retains more nor less than his requirement. This holds true for perishable commodities.

4.6 Factors Affecting Marketable Surplus

- 1) **Size of holding:** There is a positive relationship between the size of holding and marketable surplus.

- 2) **Production:** The higher the production on a farm, the larger will be the surplus and vice versa.
- 3) **Price of the commodity:** The price of a commodity and the marketable surplus have a positive relationship depending upon whether one considers the short and long run or the micro and macro levels.
- 4) **Size of family:** The larger the number of members in a family, the smaller the surplus on a farm.
- 5) **Requirement of feed:** The higher the requirement for these uses, the smaller the marketable surplus of a crop.

Self-Assessment Exercises

1. What is market surplus?
2. Outline any 4 factors affecting marketable surplus.

You learnt that

4.7 Summary

In this unit, you have learnt that:

- Producer surplus is a measure of producer welfare. It is measured as the difference between what producers are willing and able to supply a good for and the price they actually receive.
- Marketing margin is the difference between the price paid by consumer and the price received by the producer for an equivalent quantity of farm produce.
- Market surplus is the residual left with the producer farmer after meeting his requirements for family consumption, farm needs for seeds and feed for cattle, payment to labourer in kind, payment to landlord as rent and social and religious payments in kind.

4.8 References/Further Readings/Web Resources

Acharya, S.S. & Agarwal, N.L. (2006). *Agricultural Marketing in India*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Reddy, S.S., Ram, P.R., Sastry, T.V.N. & Devi, I.B. (2009). *Agricultural Economics*, (2nd ed.). New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

4.8 Possible Answers to Self-Assessment Exercise(s)

1. **Marketable Surplus:** It is the residual left with the producer farmer after meeting his requirements for family consumption, farm needs for seeds and feed for cattle, payment to labourer in kind, payment to landlord as rent and social and religious payments in kind.
2. **Factors Affecting Marketable Surplus are:**
 - a. **Size of holding:** There is a positive relationship between the size of holding and marketable surplus.
 - b. **Production:** The higher the production on a farm, the larger will be the surplus and vice versa.
 - c. **Price of the commodity:** The price of a commodity and the marketable surplus have a positive relationship depending upon whether one considers the short and long run or the micro and macro levels.
 - d. **Size of family:** The larger the number of members in a family, the smaller the surplus on a farm.
 - e. **Requirement of feed:** The higher the requirement for these uses, the smaller the marketable surplus of a crop (**any 4**).

Unit 5 Marketing Channels

Unit Structure

- 5.1 Introduction
- 5.2 Intended Learning Outcomes
- 5.3 Marketing Channels
- 5.4 Channels of Distribution
- 5.5 Factors Affecting the Choice of Marketing Channels
- 5.6 Marketing Agencies
- 5.7 Summary
- 5.8 References/Further Readings/Web Resources
- 5.9 Possible Answers to Self-Assessment Exercise(s)

5.1 Introduction

This unit will help you understand marketing channels, channels of distribution and factors affecting choice of marketing channels.

5.2 Intended Learning Outcomes

By the end of this unit, you will be able to:

- describe marketing channels
- explain the channels of distribution
- explain the factors affecting choice of marketing channels.

5.3 Marketing Channels

Marketing channels are routes through which agricultural products move from producer to consumers; the length of the channel varies from commodity to commodity, depending on the quantity to be moved, the form of consumer demand and degree of regional specialisation in production and country to country.

5.4 Channels of Distribution

Generally, the channels of distribution are follows:

- 1) Producer - Consumer
- 2) Producer - Retailer - Consumer
- 3) Producer - Wholesaler-Retailer- Consumer
- 4) Producer - Agent- Retailer-Consumer
Producer - Agent-Wholesaler- Retailer-Consumer

5.5 Factors Affecting the Choice of Marketing Channels

The choice of the channels depends upon the following factors:

1. **Perishable nature:** Choice of channels depends upon the durability of commodity. Commodities like vegetables and fruits are perishable and must be distributed through shorter channels otherwise quality of the produce will be deteriorated before it reaches to consumers.
2. **Bulk and weight:** When product is bulky and heavy, transportation cost becomes significant. One has to reduce this cost and for that selection of channel should be such that transportation cost is minimised.
3. **Financial position:** Financially sound organisations grant credit for long period while financially weak organisations have to take help of other middlemen and thus distributing channel is affected.
4. **Marketing cost:** The particular channel is better if per unit marketing cost is lower than other channels.
5. **Degree for control channels:** If the producers or co-operatives society of consumer has strong desire to control the existing channel they can do so by avoiding some of the middlemen.
6. **Storage facilities.** If producer do not have good storage facilities, then, they take help of some middlemen who possess storage facilities.
7. **Terms of payment of price:** If a particular channel offered easy terms of payment price of a commodity, producer prefer that channel than other which does not give any concessions in paying the price of that commodity.
8. **Number of consumers:** If the number of consumers are more, producers have to employ some middlemen; if consumers are less in number, then, normal sell will do the job.

5.6 Marketing Agencies

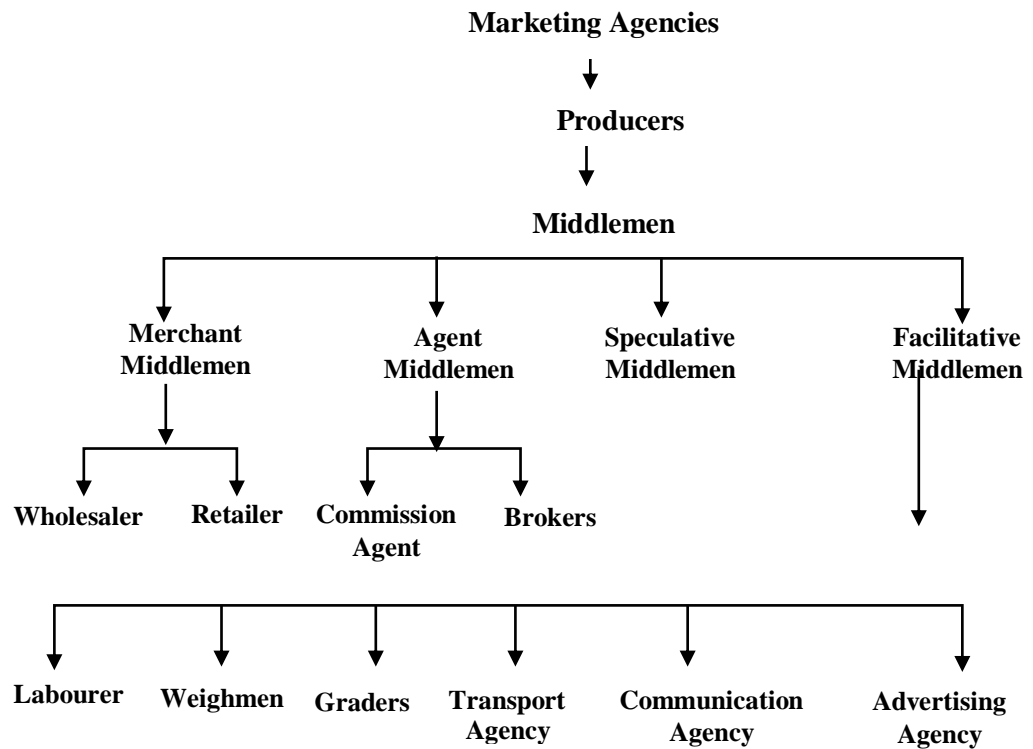


Figure 5.1: Marketing Agencies for Agricultural Commodities

In the marketing of agricultural commodities, the following agencies are involved:

1. **Producer:** Most of farmers perform one or more marketing functions. They sell the surplus, either in the village or in the market. Some big farmers assemble the produce of small farmers and transport it to the nearby market. By constant touch with market functionaries, they have a fair knowledge of market practices.
2. **Middlemen:** Middlemen are those individuals or business concerns which specialise in performing the various marketing functions. They can be classified as:
 - a) **Merchant Middlemen:** Merchant middlemen are those who take title of the goods they handle; they buy and sell on their own gain or lose, depending on the difference in the sale and purchase prices. Merchant middlemen are of two types:
 - i. **Wholesalers:** They buy and sell commodities from farmers and other wholesalers in large quantities. They sale to retailers, other wholesalers and processors either in the same market or in other markets.
 - ii. **Retailers:** Retailers buy goods from wholesalers and sale them to the consumers in small lots. They are producer's personal representatives to consumers. Retailers are the

closest to the consumer in the marketing channels. Itinerant traders and village merchants also come under this group. Itinerant traders are petty merchants who move from village to village, and directly purchase the produce from the cultivators. They transport it to the nearby primary or secondary market and sell it there. Village merchants have their small establishments in villages. They purchase the produce of those farmers who have either taken finance from them or those who are not able to go to the market. They either sell the collected product in the nearby market or retain it for sale at later date in the village itself.

- b) **Agent Middlemen:** Agent middlemen act as representatives for their clients. They do not take title to the produce. They merely negotiate the purchase and /or sale. They sell services and not the goods or commodities. They receive income in the form of commission or brokerage. Agent middlemen are of two types:
- i. **Commission agents:** A commission agent normally takes over the physical handling of the produce, arranges for its sale, collects the price from the buyer, deducts his expenses and commission and remits the balance to the seller. All these facilities are extended to buyers as well.
 - ii. **Brokers:** Brokers render personal services to their clients in the market. Unlike the commission agents, they do not have the physical control of the product. The main function of the broker is to bring together buyers and sellers on the same platform for negotiations. Their charge is called brokerage. They may claim brokerage from the buyer, the seller or both. Brokers have no establishment in the market. They simply wander about in the market and render services to clients.
- c) **Speculative middlemen:** Those middlemen who take title to the product with a view to making profit on it are called speculative middlemen. They are not regular buyers or sellers of produce. They are specialised in risk-taking. They buy at low prices when arrivals are substantial and sell in the off season when prices are high.
- d) **Facilitative middlemen:** These middlemen assist in the marketing process. Marketing can take place even if they are not active, but the efficiency of the system increases when they are present. These middlemen receive their income in the form of fees from those who used their services. They are:
- A. **Labourers:** They do unloading from and loading on to bullock carts or truck. They assist in weighing, clearing, sieving and refilling and stitch the bag of commission agent.

- B. **Weighmen:** They facilitate the correct weighing of the produce. Generally, the scale- beam balance is used. They get payment for their services through the commission agent.
- C. **Graders:** Those middlemen sort out the product into different graders, based on some defined characteristics and arrange them for sale.
- D. **Transport agency:** This agency assists in the movement of the produce from one market to another. The main transport means are railways, trucks, bullock carts, camel carts, or tractors.
- E. **Communication agency:** It helps in the communication of the information about the prices prevailing and quantity available in the market. The post and telegraph, telephone, newspaper, radio and informal links are the main communication channels in agricultural marketing.
- F. **Advertising agency:** It enables prospective buyers to know the quality of the product and decide about the purchase of commodities.

Self-Assessment Exercises

1. What are the channels of distribution?
2. Agent middlemen are of two types. Explain.

5.7 Summary

Marketing channels, channels of distribution and factors affecting the choice of marketing channels have been discussed in this unit.

You have learnt that marketing channels are routes through which agricultural products move from producer to consumers. The length of the channel varies from commodity to commodity, depending on the quantity to be moved, the form of consumer demand and degree of regional specialisation in production and country to country.

5.8 References/Further Readings/Web Resources

- Acharya, S.S. & Agarwal, N.L. (2006). *Agricultural Marketing in India*. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.
- Reddy, S.S., Ram, P.R., Sastry, T.V.N. & Devi, I.B. (2009). *Agricultural Economics*, (2nd ed.). New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

5.9 Possible Answers to Self-Assessment Exercise(s)

1.

Generally, the channels of distribution are:

1. Producer- consumer
2. Producer -Retailer- Consumer
3. Producer-wholesaler-Retailer- Consumer
4. Producer- Agent- Retailer-Consumer
5. Producer- Agent-Wholesaler- Retailer-Consumer

2. Agent middlemen are of two types:

- a. Commission agents:** A commission agent normally takes over the physical handling of the produce. Arranges for its sale, collects the price from the buyer, deducts his expenses and commission, and remits the balance to the seller. All these facilities are extended to buyers as well, it asked for.
- b. Brokers:** Brokers render personal services to their clients in the market. But unlike the commission agents, they do not have the physical control of the product. The main function of the broker is to bring together buyers and sellers on the same platform for negotiations. Their charge is called brokerage. They may clime brokerage from the buyer, the seller or both. Brokers have no establishment in the market. They simply wander about in the market and render services to clients

APPENDIX

Table I: Amount of 1 at Compound Interest

Year	1%	3%	5%	6%	8%	10%	12%	14%	15%	16%	18%
1	0.990	0.971	0.952	0.943	0.926	0.909	0.893	0.877	0.870	0.862	0.847
2	0.980	0.943	0.907	0.890	0.857	0.826	0.797	0.769	0.756	0.743	0.718
3	0.971	0.915	0.864	0.840	0.794	0.751	0.712	0.675	0.658	0.641	0.609
4	0.961	0.888	0.823	0.792	0.735	0.683	0.636	0.592	0.572	0.552	0.516
5	0.951	0.863	0.784	0.74	0.681	0.621	0.567	0.519	0.497	0.476	0.43 7
6	0.942	0.837	0.746	0.70	0.630	0.564	0.507	0.456	0.432	0.410	0.370
7	0.933	0.813	0.711	0.66	0.583	0.513	0.452	0.400	0.376	0.354	0.31 4
8	0.923	0.789	0.677	0.62	0.540	0.467	0.404	0.351	0.327	0.305	0.266
9	0.914	0.766	0.645	0.59	0.500	0.424	0.361	0.308	0.284	0.263	0.225
10	0.905	0.744	0.614	0.55	0.463	0.386	0.322	0	0.247	0.227	0.191
11	0.896	0.722	0.585	0.52	0.429	0.350	0.287	0.237	0.215	0.195	0.162
12	0.887	0.701	0.557	0.49	0.397	0.319	0.257	0.208	0.187	0.168	0.14
13	0.879	0.681	0.530	0.46	0.368	0.290	0.229	0.182	0.163	0.145	0.116
14	0.870	0.661	0.505	0.44	0.340	0.263	0.205	0.160	0.141	0.125	0.099
15	0.861	0.642	0.481	0.41	0.315	0.239	0.183	0.140	0.123	0.108	0.084
16	0.853	0.623	0.458	0.39	0.292	0.218	0.163	0.123	0.197	0.093	0.071
17	0.844	0.605	0.436	0.37	0.270	0.198	0.146	0.108	0.093	0.080	0.060
18	0.836	0.587	0.416	0.35	0.250	0.180	0.130	0.095	0.081	0.069	0.051
19	0.828	0.570	0.396	0.33	0.232	0.164	0.116	0.083	0.070	0.060	0.043
20	0.820	0.554	0.377	0.31	0.215	0.149	0.104	0.073	0.061	0.051	0.037
21	0.811	0.538	0.359	0.29	0.199	0.135	0.093	0.064	0.053	0.044	0.031
22	0.803	0.522	0.342	0.27	0.184	0.123	0.083	0.056	0.046	0.038	0.026
23	0.795	0.507	0.326	0.26	0.170	0.112	0.074	0.049	0.040	0.033	0.022
24	0.788	0.492	0.310	0.24	0.158	0.102	0.066	0.043	0.035	0.028	0.019
25	0.780	0.478	0.295	0.23	0.146	0.092	0.059	0.038	0.030	0.024	0.016
26	0.772	0.464	0.281	0.22	0.135	0.084	0.053	0.033	0.026	0.021	0.014
27	0.764	0.450	0.268	0.20	0.125	0.076	0.047	0.029	0.023	0.018	0.011
28	0.757	0.437	0.255	0.19	0.116	0.069	0.042	0.026	0.020	0.016	0.010
29	0.749	0.424	0.243	0.18	0.107	0.063	0.037	0.022	0.017	0.014	0.008
30	0.742	0.412	0.231	0.17	0.099	0.057	0.033	0.020	0.015	0.012	0.007
35	0.706	0.355	0.181	0.13	0.068	0.036	0.019	0.010	0.008	0.006	0.003

40	0.672	0.307	0.142	0.09	0.046	0.022	0.011	0.005	0.004	0.003	0.001
				7							
45	0.639	0.264	0.111	0.07	0.031	0.014	0.006	0.003	0.002	0.001	0.001
				3							
50	0.60	0.228	0.087	0.05	0.021	0.009	0.003	0.001	0.001	0.001	0.000
				4							

Appendix Table II
Present value of 1 at Compound Interest.

Year	1%	3%	5%	6%	8%	10%	12%	14%	15%		
	16%	18%									
1	0.990	0.971	0.952	0.943	0.926	0.909	0.893	0.877	0.870	0.862	0.847
2	1.970	1.913	1.859	1.833	1.783	1.736	1.690	1.647	1.626	1.605	1.566
3	2.941	2.829	2.723	2.673	2.577	2.487	2.402	2.322	2.283	2.246	2.174
4	3.902	3.717	3.546	3.465	3.312	3.170	3.037	2.914	2.855	2.798	2.690
5	4.853	4.580	4.329	4.212	3.993	3.791	3.605	3.433	3.352	3.274	3.127
6	5.795	5.417	5.076	4.917	4.623	4.355	4.111	3.889	3.784	3.685	3.498
7	6.728	6.230	5.786	5.582	5.206	4.868	4.564	4.288	4.160	4.039	3.812
8	7.652	7.020	6.463	6.210	5.747	5.338	4.968	4.639	4.487	4.344	4.078
9	8.566	7.786	7.108	6.802	6.247	5.759	5.328	4.946	4.772	4.607	4.303
10	9.471	8.530	7.722	7.360	6.710	6.145	5.650	5.216	5.019	4.833	4.494
11	10.368	9.253	8.306	7.887	7.139	6.495	5.938	5.453	5.234	5.029	4.656
12	11.255	9.954	8.863	8.384	7.536	6.814	6.194	5.660	5.421	5.197	4.793
13	12.134	10.635	9.394	8.853	7.904	7.103	6.424	5.842	5.421	5.342	4.910
14	13.004	11.296	9.899	9.295	8.244	7.367	6.628	6.002	5.583	5.468	5.008
15	13.865	11.938	10.380	9.712	8.559	7.606	6.811	6.142	5.724	5.575	5.092
16	14.718	12.561	10.838	10.106	8.851	7.824	6.974	6.265	5.837	5.668	5.162
17	15.562	13.166	11.274	10.477	9.122	8.022	7.120	6.373	6.047	5.749	5.222
18	16.398	13.754	11.690	10.828	9.372	8.201	7.250	6.467	6.128	5.818	5.273
19	17.226	14.324	12.085	11.158	9.604	8.365	7.366	6.550	6.198	5.877	5.316
20	18.046	14.877	12.462	11.470	9.818	8.514	7.469	6.623	6.259	5.929	5.353
21	18.857	15.415	12.821	11.764	10.017	8.649	7.562	6.687	6.312	5.973	5.384
22	19.660	15.937	13.163	12.042	10.201	8.772	7.645	6.743	6.359	6.011	5.410
23	20.456	16.444	13.489	12.303	10.371	8.883	7.718	6.792	6.399	6.044	5.432
24	21.243	16.936	13.799	12.550	10.529	8.985	7.784	6.835	6.434	6.073	5.451
25	22.023	17.413	14.094	12.8	10.675	9.077	7.843	6.873	6.464	6.097	5.467
26	22.795	17.877	14.375	13.003	10.81	9.161	7.896	6.906	6.491	6.118	5.480
27	23.560	18.327	14.643	13.211	10.935	9.237	7.943	6.935	6.514	6.136	5.492
28	24.316	18.764	14.898	13.406	11.051	9.307	7.984	6.961	6.534	6.152	5.502
29	25.066	19.188	15.141	13.591	11.158	9.370	8.022	6.983	6.551	6.166	5.510
30	25.808	19.600	15.372	13.765	11.258	9.427	8.055	7.003	6.566	6.177	5.517
35	29.409	21.487	16.374	14.498	11.655	9.644	8.176	7.070	6.617	6.215	5.539
40	32.835	23.115	17.159	15.046	11.925	9.779	8.244	7.105	6.642	6.233	5.548
45	36.095	24.519	17.774	15.456	12.108	9.863	8.283	7.123	6.654	6.242	5.552
50	39.196	25.730	18.256	15.762	12.234	9.915	8.304	7.133	6.661	6.246	5.554