



JHARKHAND
Rai University
RANCHI

Laboratory Manual

Course- Agricultural Finance and Co-operation

Course Code- 13A.210

B.Sc. (Hons.) Agriculture IIIrd Semester

Department of Agriculture

Jharkhand Rai University, Ranchi

CONTENTS		
Sl No.	Experiments	Page No.
1.	Basic terms related with agricultural finance and cooperation	1-2
2.	Determination of most profitable level of capital use	3
3.	Analysis of progress and performance of cooperatives using published data	4-5
4.	Analysis of progress and performance of commercial banks and RRBs using published data	6-7
5.	Visit to a commercial bank, cooperative bank and cooperative society to acquire first-hand knowledge of their management, schemes and procedures	8-10
6.	Time Value of Money	11-13
7.	Preparation and analysis of balance sheet – A case study	14-17
8.	Preparation and analysis of income statement – A case study	18-20
9.	Appraisal of a loan proposal – A case study	21-23
10.	Techno-economic parameters for preparation of projects	24-27
11.	Preparation of Bankable projects for various agricultural products and its value added products	28-32
12.	Seminar on selected topics	

Experiment No.1: Basic terms related with agricultural finance and cooperation

1. Advances: The amount of loan advanced / extended by an institution during a particular period, usually an agricultural year or a season.

2. Agricultural Finance: refers to financial assistance rendered by the commercial banks, Cooperatives or non-institutional agencies to the farmers for the development of agriculture and allied occupations, in cash/kind including the farm advisory service under intensive supervision OR Agricultural finance refers to sub-set of rural finance dedicated to financing agriculture-related activities, such as input supply, production, distribution, wholesaling, and marketing. It is an economic study of financing farm business. Agricultural finance includes agricultural credit, income, saving, investment and capital formation. It includes study of both lender and borrower.

3. Amortization: Gradual repayment or writing off of an original amount. This is a process of expiration of the costs of an intangible asset.

4. Annuity: An annuity is a stream of constant cash flow (payment or receipt) occurring at regular intervals of time. E.g.: premium payment of a life insurance policy.

5. Appraisal: Analysis of a proposed investment to determine its merit and acceptability in accordance with established decision criteria.

6. Assets: are those which are owned by the farmer.

7. Authorized capital: Refers to the amount, which the company is authorized by the Registrar of companies to raise, or the maximum amount, which a company can raise.

8. Bank Rate: Rate at which RBI discounts first class bills and other treasury bills. At present it is 6.0% or it is the rate at which, the RBI lends loans to its members and subsidiary banks/ institutions. Or as the standard rate at which it (the bank) is prepared to buy or rediscount bills of exchange / other commercial papers eligible for purchase. Or it is the rate of interest charged by the Reserve Bank of India (RBI) on financial accommodation extended to banks. The support is provided in the form of bills rediscounting facility and advances or refinance against specified assets (e.g. treasury bills and dated securities) or promissory notes.

9. Bank: is an institution that is keeping, lending and exchange etc., of money and providing agricultural finance to the farmers.

10. Bond: A bond is a security promising to pay a certain amount of rupees in interest depending upon the maturity period. Or a written obligation under seal or a certificate of indebtedness, a bond is evidenced by a debt issued by a Government, an agency of Government, or by a private corporation. A long-term debt instrument on which the issuer pays interest periodically, known as 'Coupon'. Bonds are secured by collateral in the form of immovable property. While generally, bonds have a definite maturity, 'perpetual bonds' are securities without any maturity. In the U. S., the term debentures refer to long-term debt instruments which are not secured by specific collateral, so as to distinguish them from bonds.

11. Borrower: is one who take a loan from the bank includes a member-government itself, a public agency or corporation, or a private body or corporation with the Govt. guarantee.

12. Borrowing: it is to acquire something, especially money, temporarily with the promise or intention of returning. Borrowing is an economic bargain with a pledge.

13. Bear: A person who expects share prices in general to decline and who is likely to indulge in short sales.

14. Bull: A person who expects share prices in general to move up and who is likely to take a long position in the stock market.

15. Capital: capital is produced means of production. All capital is necessarily wealth but all wealth is not necessarily capital. Ex: machinery, raw material, transport equipment, dams, etc. Money when used for the purchase of capital goods, then only it becomes capital.

16. Capital rationing: Limiting the capital budget is referred to as capital rationing.

17. Cash flows: Every project has a series of cash flows over a period of time. Cash flows are of two types, viz. cash outflows and cash inflows. The difference between the two is the net cash flow. Cash outflows occur in the business because of purchase of raw material, purchase of assets and repayment of loans. Cash inflows occur because of sale of produce, sale of assets and borrowing. One has to ensure that the net cash flows are positive in the business. A cash flows can be positive or negative. A positive cash flow is called a cash inflow and a negative cash flow is called a cash outflow. Cash outflows refer to investment expenditure and cash inflows refers to income / returns received from project.

Experiment 2: Determination of Most Profitable Level of Capital Use

1. Objective

To determine the level of capital use at which the farmer obtains maximum profit by comparing **Marginal Value Product (MVP)** of capital with its **Marginal Factor Cost (MFC)**

2. Theoretical Background

- **Capital in Agriculture:** Includes money spent on seeds, fertilizers, irrigation, machinery, etc. Proper allocation of capital is essential for maximum returns.
- **Key Concepts:**
 1. **Marginal Physical Product (MPP):** Additional output obtained by using one more unit of capital.
 2. **Marginal Value Product (MVP):** Additional value of output due to an additional unit of capital.

$$\text{MVP} = \text{MPP} \times \text{Price of output}$$

3. **Marginal Factor Cost (MFC):** Cost of using one additional unit of capital (usually the interest rate or opportunity cost of capital).
- **Decision Rule:**
 - Profit is maximized when $\text{MVP} = \text{MFC}$
 - If $\text{MVP} > \text{MFC}$ → Increase use of capital.
 - If $\text{MVP} < \text{MFC}$ → Reduce use of capital.

3. Procedure (Steps in Practical Work)

1. **Collect farm data:** Output levels corresponding to different levels of capital use (₹ spent).
2. **Compute MPP:** Find the change in output with change in capital.
3. **Compute MVP:** Multiply MPP by price of output.
4. **Compare MVP with MFC:**
 - If $\text{MVP} = \text{MFC}$ → optimum level of capital use.
 - If $\text{MVP} > \text{MFC}$ → further capital use is profitable.
 - If $\text{MVP} < \text{MFC}$ → excess capital is being used.
5. **Plot the graph:** Capital use on X-axis, MVP and MFC on Y-axis. The intersection shows the most profitable level.

Experiment 3: Analysis of progress and performance of co-operatives using published data

Objective

To evaluate the growth, progress, and overall performance of co-operatives using published secondary data (government reports, annual reports, statistical handbooks, NABARD/RBI data, etc.).

Instructions for Students

1. Data Collection

- Obtain **published data** on co-operatives from reliable sources such as:
 - Government publications (e.g., RBI reports, NABARD reports, Agricultural Census).
 - Annual reports of state/central co-operative departments.
 - Research articles, journals, and statistical abstracts.
- Collect data covering at least **5–10 years** for meaningful trend analysis.

2. Identification of Variables

- Select key indicators that reflect the **progress and performance** of co-operatives, such as:
 - Membership size.
 - Share capital.
 - Working capital.
 - Loans advanced/credit disbursed.
 - Recovery performance.
 - Profit/loss trends.
 - Area of operation/coverage.

3. Data Presentation

- Organize the collected data in **tabular form** (year-wise).
- Use **graphs/charts** (line, bar, or pie charts) to show trends over time.

4. Analysis

- Compute **growth rates, compound annual growth rate (CAGR), or percentage changes** to analyze progress.
- Compare **performance indicators** across years or between types of co-operatives (e.g., credit vs. marketing vs. dairy).
- Assess strengths (growth areas) and weaknesses (declining trends).

5. Interpretation

- Provide a **critical interpretation** of the results:
 - Has membership increased or declined?
 - Is financial performance improving?
 - Are loan recovery rates satisfactory?
 - What challenges are visible in the data?
- Link findings to **policy initiatives** or **socio-economic factors**.

6. Report Writing

- Prepare a **structured report** with the following sections:

1. Introduction (brief on co-operatives and purpose of the study).
2. Data source and methodology.
3. Analysis of progress (with tables/graphs).
4. Analysis of performance indicators.
5. Key findings and interpretation.
6. Conclusion and suggestions.

Experiment 4: Analysis of progress and performance of commercial banks and RRBs using published data

Objective

To study and evaluate the progress and performance of Commercial Banks and Regional Rural Banks (RRBs) using published secondary data from reliable sources.

Instructions for Students

1. Data Collection

- Collect **published data** from reliable sources such as:
 - Reserve Bank of India (RBI) annual reports.
 - NABARD annual reports.
 - Economic Survey of India.
 - Statistical handbooks and government publications.
 - Research journals/articles.
- Use data covering at least **5–10 years** for meaningful trend analysis.

2. Selection of Indicators

- Identify relevant indicators of **progress** and **performance**, such as:
 - Number of branches.
 - Deposits mobilized.
 - Loans and advances disbursed.
 - Priority sector lending.
 - Non-Performing Assets (NPAs).
 - Credit–deposit ratio.
 - Profitability indicators.
 - Financial inclusion indicators (SHG-Bank linkage, Kisan Credit Cards, etc.).

3. Data Presentation

- Organize the data into **clear, year-wise tables**.
- Present trends using **graphs, bar diagrams, or line charts** for better understanding.

4. Analysis

- Compute growth rates and percentage changes to analyze **progress** over time.
- Compare **performance indicators** between Commercial Banks and RRBs.
- Highlight strengths (e.g., credit growth, outreach) and weaknesses (e.g., NPAs, low recovery).

5. Interpretation

- Critically interpret the results:
 - Has there been a significant expansion in banking outreach?
 - Are Commercial Banks or RRBs performing better in rural credit delivery?
 - How have NPAs and profitability trends changed over time?

- What role do these institutions play in promoting financial inclusion?

6. **Report Preparation**

- Write a **systematic report** with the following structure:
 1. Introduction (importance of Commercial Banks & RRBs in rural development).
 2. Data source and methodology.
 3. Progress analysis (branch network, deposits, credit flow).
 4. Performance analysis (NPAs, profitability, credit–deposit ratio, inclusion).
 5. Interpretation of results.
 6. Conclusion and policy suggestions.

Experiment 5: Visit to a commercial bank, cooperative bank and cooperative society to acquire first-hand knowledge of their management, schemes and procedures

Visit to and study of district central cooperative bank (DCCB)

These banks are in fact the link between SCB and PACS. They are basically meant to meet the credit requirements of PACS. They also undertake banking business such as accepting deposits from public, collecting bills, cheques, drafts, etc. and providing credit to the needy persons. The area of operation of the banks varies from the taluka to the district, but in most of the states their operations are confined to the taluka level. Membership is open to individuals and societies, working in its area of operation. Marketing societies, consumer societies, farming societies, urban banks and PACS are usually enrolled as members of the DCCB.

Functions: (1) They supervise and inspect the activities of PACS and help the credit societies run smoothly, (2) They maintain close and continuous contact and guide the primary societies and provide leadership to them; (3) They undertake non-credit activities like supply of seeds, fertilizers besides sugar, kerosene and other consumer goods; (4) They provide requisite funds to the societies under their control; and (5) They accept deposits from the member societies as well as from public.

Visit to and study of commercial banks (CBS)

Commercial bank is an institutional financial agency for the provision of funds for agricultural operations, but the role played by them is very insignificant in this respect. They have not been taken interest in fulfilling the financial needs of cultivators. All India Rural Credit Survey Report has observed that commercial banks were responsible for the provision of about 1 per cent of the total borrowings of cultivators in 1951-52. The situation has not changed much since then. In 1959-60, the Rural Credit Follow up Survey have surveyed 9 districts. They found that it was only in one district that borrowing from commercial banks was reported. In remaining districts, no borrowings were made by cultivators from banks. This state of affair is really very disheartening.

In other countries the commercial banks are potential suppliers of institutional finance to agriculturists. They do not keep themselves so much aloof from this sector as it is the case in our country. As mentioned above, the proportion of agricultural advances to total advances made by these banks are on the decline year by year instead of being increased to boost agricultural production to avert the major crisis of the economy. On the other hand, the role of commercial banks in agricultural credit is negligible in India. The proportion in Japan is also not very high; but it is still seventeen times higher than that in India. In India it has further decreased to 0.2% in recent years.

Commercial banks have confined themselves largely to the provision of credit to plantations where risk is more predictable. Indirectly, they finance agriculture to a large extent, through indigenous bankers, moneylenders, traders, merchants etc. They finance various agro industries of the country which also form part and parcel of the rural economy. In addition, they take part in financing the movement and marketing of agricultural produce, assist the land mortgage

banks of the various States, and act as lenders to co-operative banks and co-operative marketing societies but not very significantly. As a matter of fact, commercial banks are interested in rural areas for the purpose of attracting deposits than for financing agriculture.

Why Commercial Banks Finance Agriculture?

As is known, credit requirements of the farmers are fulfilled by institutional as well as non institutional agencies. But, it is said without any doubt that for decades, co-operatives had remained an exclusive source of institutional finance in the rural areas of the country. In 1950-51, they shared 3 percent of the total requirement of rural credit. Co-operative credit societies are the best agency to meet the needs of credit of the cultivators. Thus, the Rural Credit Survey Committee has observed that although co-operative credit has failed, yet there is no alternative to cooperative form of association in the village for the proper promotion of agricultural credit and development. In view of this, co-operatives received substantial loans as a policy from the Reserve Bank of India and massive assistance from the center and state Govts. in the form of subsidies and concessions. However, the main reasons why commercial banks finance agricultural sector is described as below.

1. Adoption of New Technology in Agriculture: Apart from increasing the growth rate of food grains production and achieving the motto of self-sufficiency, stress has been laid on the high yielding varieties of food grains. The programme which has been drawn for this purpose is termed as new technology. The main aspects of this strategy comprise of increased supply of fertilizer and pesticides, multiple cropping, more use of high yielding varieties of W as well as intensive utilization of irrigation facilities.

2. Rural Development: Upliftment and upgradation of rural areas is of utmost importance for the socio-economic development of the country. Therefore, the development of rural sector in general and agriculture in particular has accorded the attention of the planner's right from the advent of planning. There are still, 272 million people in the country who live in poverty. The fruits of economic development have yet not percolated to this section of society. Therefore, any development effort will remain lopsided until and unless rural India prospers and the men having been in the shackles of poverty are emancipated.

3. Need for Credit: Credit is the key input in every development programme. This is particularly true for rural development because so long as sufficient credit is provided to the development programs of all the weaker Sections of the society, the goal of development cannot be achieved. In view of this in 1968, the Govt. imposed a scheme of social control. Moreover in July, 1969 fourteen major commercial banks were nationalized and 6 more banks in April, 1980. Therefore, due to these reasons, commercial banks were asked to deploy their loanable resources in rural areas

4. Lending Policies: Reserve Bank of India in his guidelines directed the commercial banks to improve the quality of their lending. It is so as to facilitate the borrowers to move to a higher technological plane, to move away from, "security-oriented lending to purposive and productive lending. The basic approach of the banks in financing or weaker sections has been to formulate viable schemes in which poor can participate so that their income could go up. This approach is also being pursued under the Integrated Rural Development Programme.

What Commercial Banks do for Agricultural Finance?

1. Nature of Assistance Provided Indirect Financing: After the establishment of State Bank of India in 1955, commercial banks were expected to open branches in rural areas. The State Bank of India was given the special role to provide remittance facilities to co-operative and commercial banks. It was also providing credit facilities to co-operative marketing and processing societies. In this way, there was no direct financing of cultivators by the banks up to 1955. It was in sixties that when indirect financing by the banks through existing rural institution was initiated. Commercial banks also started to finance agriculture indirectly. At present, commercial banks are financing cultivators through primary credit societies as well as they are directly advancing loans to the farmers.

2. Direct Financing: The social control policy being adopted in 1968, directed the commercial banks to finance the cultivators. The concept of priority sector was developed which was to be helped by the commercial banks. Since then, commercial banks have started to finance agriculture and allied activities. Direct financing includes short-term, medium term and long-term loans. Short term loans are repayable within a period of one-year, medium term loans are repayable over a period of live years while the long-term loans are repayable over a period of ten years.

STUDY QUESTIONS:

1. Write the progress of Commercial Banks (CBs) in Jharkhand & India during 2010 to 2025 (Collect the information on Numbers, Number of branches, Owned funds, deposits, Borrowings, Loans issued and loans outstanding).
2. Students should collect and discuss the working of above mentioned institutions based on the topic outline given below. (During visit): 1) Nature and organizational set-up (2) objectives/ functions (3) Am of operation (4) Membership (5) Management of the society (6) Sources of hind (7) Types of loans given and target group (8) Mode of disbursement of loan (9) Loaning procedure security and documents(10) Appraisal of credit needs methods followed (11) Scale of finance for various activities (12) Fixation of repayment schedules and method of recovery (13)Any special repayment drive (14) interest rate for various purposes and penal interest (15) Over-dues percentage, reasons” etc. (16) audit classification (17) Loan supervision pre and post-sanction, measures for avoiding double financing (18) Custom-hiring and other activities (19) Technical guidance -nature (20) Marketing arrangements (21) Other activities, if any (22) Recent changes in lending norms/policies.

Experiment No. 6: Time value of money

It is also called time comparison principle, which deals with decision over time. Time decisions come in farm financial management in many ways. Time preferences for financial claims are quoted in market by means of interest rate. Interest rates are the exchange prices between present and future values of financial claims.

There are two types of investments. (1) investment on operating or working inputs viz., seed, fertilizers, plant protection chemicals, fuel, feeds, veterinary medicines, etc. and (2) investment on capital assets viz., land, farm buildings, machinery and equipment. Analysis of an investment involves not only the comparison of costs and returns associated with it, but also the timings of occurrence of costs and returns.

While some of this expenditure is non-recurring, others are recurring expenditure. Even all non-recurring expenditure may not be incurred in a particular month or a year, but rather spread over a number of months or years. Returns may be received in future over many years. To examine the profitability of these investments it requires the recognition of time value of money. Money has time value. A rupee today is more valuable than a rupee a year after. Money has time value for the following reasons.

1. **Earning Power of Money:** Whenever there are many opportunities for investment, then money possesses earning power. The earning power is represented by the opportunity cost of money (rate of interest).

2. **Inflation:** Purchasing power of money varies inversely with the price level. Thus the value of money changes with inflation and deflation. In an inflationary period a rupee today represents a greater real purchasing power than a rupee a year later or rupee earned a year from now is less valuable than a rupee earned today. .

3. **Uncertainty:** Investment deals with future and future is uncertain. Investment is concerned with the commitment of funds today with the expectation of receiving a stream of benefits in the future. The following methods are used in investment decisions.

1. Future value of a present investment/income / money- it is called compounding

2. Present value of a future investment/income / money- it is called discounting

Computational procedure

1. **Future value of present money (compounding):** A rupee today is worth more than a rupee in future. This is primarily due to its opportunity cost, i.e., interest. The procedure for determining the future value of present investment in the project is calculated by using the well-known formula of compound interest:

$$FV_n = P_o (1+i)^n$$

Where,

FV_n = Future value of present sum invested in n^{th} year,

P_0 = Principal amount invested in the project,

i = Interest rate in per cent, and

n = Number of years.

1. **Future value of an Annuity:** Annuity means a stream of payments or returns over time.

The future value of annuity can be estimated using the following equation:

$$FVA_n = P_0 \left[\frac{(1+i)^n - 1}{i} \right]$$

Where,

FVA_n = Future value of an annuity which has a duration of n periods,

P_0 = Annual investment or constant periodic flow,

n = Time period or duration of the annuity (years) and

i = Interest rate

The term $\left[\frac{(1+i)^n - 1}{i} \right]$ is referred to as the future value interest factor ($FVIF_{i,n}$) for an annuity

2. **Present value of future money (discounting):** The present value of future sum is the current value of investment to be received in the future. The procedure for determining the present value of future amount can be written

$$PV_n = P_n \times (1+i)^{-n}$$

Where,

PV_n = Present worth of future money,

P_n = Principal invested at the n^{th} year or money value in future,

n = Number of years (discounting period), and

i = Rate of interest or discount rate.

2.1. Present value of an annuity: It is the sum of the Present value of all the inflows of the annuity. The present value of annuity or stream of constant annual payment is found out using the following formula:

$$PVA_n = P_n \left[\frac{(1+i)^n - 1}{i} \right] \frac{1}{(1+i)^n}$$

Where,

PVA_n = Present value of an annuity which has a duration of 'n' periods,

P_n = Money value in future or constant periodic flow, n = Duration of the cash flow stream (years) and i = Interest (discount) rate, and $\left[\frac{(1+i)^n - 1}{i} \right] \frac{1}{(1+i)^n}$ is referred as the present value interest factor ($PVIF_{i,n}$) for an annuity

STUDY QUESTIONS:

1. Compute future value (5th and 10 th yrs) of present investment of Rs 15000 at 5% and 8% interest rate?
2. Compute present value of future returns (5th and 10th year) of Rs 15000 at 5% and 8% interest rate?
3. Suppose you want to buy a new car by paying Rs 12000 per month for 3 yrs , If the rate of interest on car finance is 1.5% per month. How much can you borrow?
4. What is the present value of Rs 7000 at the end of 5 years from a given investment, If the rate of interest is 6.5 % per annum?
5. Suppose you invest Rs 1000 for 3 yrs in a saving account that pays 10% per year. What is the future value of an investment?
6. Suppose you deposit Rs 5000 annually in a a bank for 5 yrs and your deposits earn a compound interest of 10%. What will be the future value of this annuity at the end of 5 yrs.?
7. Suppose you expect to receive Rs 1000 annually for 3 years at the discount rate of 10%. What is the present value of this stream of benefits (annuity)?
8. Determine the present value of individual cash flow streams using a discount rate of 12%

Year end	Cash flows	Present value factor [PVIF 12%'n]	Present value of individual cash stream
(1)	(2)	(3)	(2) x (3) = (4)
1	1000		
2	2000		
3	3000		
4	4000		
5	5000		
6	6000		
7	7000		
8	8000		
Present Value of Cash Flow Streams=			

Experiment No. 7: Preparation of balance sheet

Balance sheet is the most widely used statement for measuring farm business performance. It is also called as **Net worth statement**. It is a summary of statement showing the **assets, liabilities and net worth or net deficit** of a farm business over a point of time. It indicates a snapshot of a farm business on a given date. The balance sheet is the statement 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 the liabilities it is called net worth or equity and its converse is known as net deficit. The typical balance sheet shows assets on the left-hand side and liabilities and equity on the right-hand side.** Both sides are always in balance, hence the name balance sheet. Net worth is placed on the right-hand 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 in the presence of farm records. It can be prepared at any point of 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, total liabilities and net worth or net deficit of the farm.

1. **Assets:** Assets are those, which are owned by the farmer. Assets are 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.

a) **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 paddy, black gram, jowar, wheat, etc.**

b) **Intermediate or Working Assets:** Intermediate assets are less liquid than the current assets. Examples: **Machinery, equipment, livestock, tractors, trucks, etc.**

c) **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. E.g.: **Land, farm buildings, etc.**

2. **Liabilities:** refers to all the things, which are owed to others by the farmer.

a) **Current Liabilities:** Debts that must be paid in the short term or in very near future. E.g.: Crop loans, accounts payable, hand loans, etc.

b) **Intermediate Liabilities:** These loans are due for the repayment within a period of two to five “years.” E. g.: Livestock loans, machinery loans, etc.

c) **Long-term Liabilities:** The duration of loan repayment is five or more years.

E.g.: Tractor loan, orchard loan, land development loan, etc.

3. **Net worth or net deficit:** shows the difference between the assets and liabilities, and if the difference is positive, it is called **net worth (solvency position/ credit worth /owner's equity)**. In case the difference is negative, it is called **net deficit (insolvency position)**.

Test Ratios: The balance sheet is analyzed with the help of a number of financial ratio measures so as to know the **exact financial (solvency) position** and stability of the farm business.

The test ratios, viz, **current capital ratio, intermediate (working) ratio, net capital ratio, quick ratio, Current liquidity ratio, debt-equity ratio and equity-value ratio** are used to analyze the balance sheet.

1. **Current ratio**= Total current assets / Total current liabilities

This ratio indicates the capacity of the farmer to meet immediate financial obligations or measure the degree of **immediate solvency of the business**.

$$\frac{\text{Total current assets} + \text{total intermediate assets}}{\text{Total current liabilities} + \text{total intermediate liabilities}}$$

2. **Working ratio** = -----
 Total current liabilities +total intermediate liabilities

This indicates the liquidity position of the farm business over an intermediate period of time, ranging from **2 to 5 years**. This ratio **should also be more than one** to indicate sound running of the farm business.

3. **Net Capital Ratio** = Total assets /Total liabilities

If the net capital ratio is **more than one**, the funds of the institutional agencies are safe. This ratio is also the most important measure of overall solvency position of the farmer-borrowers in the long-run. It indicates the long liquidity position of the farm business.

4. **Fixed ratio** = Fixed or long-term assets / Fixed or long-term liabilities

This ratio measures the financial safety of the business over a longer period of time.

5. **Acid test ratio or Quick ratio**= Cash receipts + accounts receivable + marketable securities (Bonds, shares etc.) available more than one year / 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.**

6. **Current liabilities ratio** = Current liability / Owner's equity

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.

7. **Debt-equity Ratio (Leverage Ratio)** = Total Debt/ Owner's equity

This ratio indicates the capacity of the farmer to meet the long-term commitments. **A consistently falling ratio indicates a very heartening performance** of farming and the ability of the farmer to reduce dependence on borrowings'

8. **Equity to asset value ratio** = net worth /Value of assets (total assets)

This ratio measures the **overall financial position of the farm Business**.

9. **Equity Ratio** = Net worth / Total liabilities

STUDY QUESTION

1. Work out the relevant financial ratios and comment on the financial soundness of farm business for the following information:

Balance sheet of Mr. Pankaj's Farm in Kalahandi district as on 31st December 2018

Assets	Amount (in Rs)	Liabilities	Amount (in Rs)
Current Assets		Current Liabilities	
Cash on hand	50,000	Crop loans	8,000
Saving in bank	8,000	Accounts payable	11,000
Value of grains for sale	50,000	Hand loans	5,000
Livestock for sale	25,000	Money owed to input supplies	50,000
Value of bonds and shares	2,000	Amount due to seed dealers	25,000
Total		Total	
Intermediate assets		Intermediate liabilities	
Dairy and cattle	10,000	Livestock loans (outstanding amounts)	15,000
Bullocks	9,000	Machinery loans (outstanding amounts)	15,000
Poultry birds	15,000	Unsecured loans (outstanding amounts)	10,000
Machinery and equipment	15,000		
Tractor	1,75,000		
Sub total		Sub total	
Long term assets		Long term liabilities	
Land	6,00,000	Tractor loan (o/u)	1,20,000
Farm building	1,75,000	Medium term loans for cows (o/u)	1,50,000
Sub total		Sub total	
Total of assets		Total of liabilities	
		Net worth	
		Total of liabilities and Net worth	

2. If the owner's equity is Rs.10000 and total liabilities are 25,000, what is the value of total assets?

3. If the total assets of a business are 1, 50,000 and the total liabilities are Rs.75,000, what is the amount of owners' equity?
4. If the total assets of a business are worth Rs 1, 25,000 and the owners' equity is 30,000, what is the amount of liabilities?

Experiment No. 8: Preparation of income statement

An income statement is also called as Profit and Loss Statement. It is defined as a summary of receipts and gains minus expenses and losses during a specified accounting period (usually a year). It is nothing but input and output expressed in value terms. Income statement is supplemented by showing where the funds come from and where the funds are used. It reveals the success or failure of a farm business over a period of time. Income statement basically constitutes three items, viz., receipts, expenses and net income.

This is entirely different from a balance sheet in the sense that in a balance sheet, we considered assets and liabilities and did not consider operational efficiency in terms of receipts and expenses. In income statement, the items included are receipts, expenses, gains and losses. It is prepared for the entire farm for one agricultural year. In income statement monetary values are assigned to inputs and output. It is also prepared over time. Primary function of Income statement is to know the returns and expenses involved in business during given period with resultant of net profit or net loss. Income statement is opening point of cash flow statement.

Receipts: They mean the returns obtained from the sale of crop 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.

FINANCIAL MEASURES:

Net income = cash receipt -- cash expenses

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 = Gross income - operating expenses

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 operating income- Fixed cost. Compared to net cash income and income operating income, it is relatively better measure of assessing the performance of a farm. It is the return accrued to own capital and family labor employed.

Ratio Measures:

1. Operating Ratio = $\frac{\text{Total operating expenses}}{\text{Gross income}}$
2. Fixed Ratio = $\frac{\text{Fixed expenses}}{\text{Gross Income}}$
3. Gross Ratio = $\frac{\text{Total expenses}}{\text{Gross income}}$
4. Rate of return on investment = $\frac{\text{Net farm income}}{\text{Total assets}}$
5. Rate of capital turn over = $\frac{\text{Gross income}}{\text{Total Assets}}$

This measure shows how efficiently the farm has used its capital resources to generate output. A high turnover ratio means one should try to use the capital assets more fully or sell some of them.

Exercise

1. Work out Net cash income, net operating income and net farm income and the relevant ratio measures and comment on the financial soundness.

Income statement of Mr. Anshuman's farm for the period 2017-18	Amount (Rs.)
Particulars	
I. RECEIPTS	
A. Returns from the sale of crop output(Paddy+ Pulses)	52,000
B. i. Revenue from milk and milk products	5,000
ii. Revenue from poultry enterprise	12,000
iii. Revenue from supplementary enterprise(i+ii)	
C. Gifts	2,000
D. Gross cash income(A+B+C)	
E. Appreciation on the value of assets	3,000
F. Gross Income(D+E)	
II. EXPENSES	
i. Operating expenses or costs	
A. Hired Human labor	10,500
B. Bullock labor	900
C. Machine labor	1500
D. Seeds	1100
E. Feeds	5000
F. Manures and Fertilizers	3000
G. Plant protection measures	1550
H. Veterinary aids	500
I. Irrigation	250
J. Miscellaneous	2000
K. Interest on working capital	2100
Total operating expenses	
FIXED EXPENSES OR COSTS	
L. Depreciation	
M. Land revenue	
N. Interest on Fixed capital	
O. Rental value of owned land	
Total Fixed Costs	
Net cash income:	
Net operating income:	
Net farm Income	

Experiment 9: Appraisal of a loan proposal – A case study

Loan appraisal is one of the most important functions of financial institutions, particularly in the agricultural sector where farmers often require credit for production, investment, and consumption purposes. **Appraisal of a loan proposal** refers to the systematic evaluation of a borrower's request for credit by assessing its technical, financial, economic, and managerial feasibility. The main purpose is to ensure that the loan is **safe, productive, and repayable**. It allows the lending institution to minimize credit risk and helps the borrower plan their enterprise efficiently.

Loan appraisal involves collecting and analyzing detailed information about the borrower, the project, repayment capacity, and prevailing market conditions before a decision is made to sanction or reject the loan. The appraisal process also helps in designing suitable repayment schedules and loan terms.

Key Aspects of Loan Appraisal

A comprehensive loan appraisal typically includes the following aspects:

- 1. Technical Feasibility:**
Examines whether the proposed project is technically sound and practically implementable. It involves evaluating the type of enterprise, technology used, input requirements, and availability of resources.
- 2. Financial Feasibility:**
Assesses the cost of the project, expected income, profitability, cash flow, and repayment capacity. Financial indicators such as Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), and Debt Service Coverage Ratio (DSCR) are often used.
- 3. Economic Viability:**
Evaluates the project's contribution to income generation, employment, and overall economic development of the region.
- 4. Managerial Competence:**
Considers the borrower's experience, skills, and ability to manage the enterprise successfully.
- 5. Market and Risk Assessment:**
Analyzes the availability of markets for the product, price stability, competition, and potential risks that could affect the success of the project.

Case Study: Appraisal of a Dairy Loan Proposal

Borrower Profile:

- Name: Mr. Ramesh Kumar
- Location: Village Rampur, Nadia District, West Bengal

- Landholding: 2.5 hectares of irrigated land
- Existing Enterprises: Paddy and vegetable cultivation
- Credit History: Satisfactory, previous crop loan repaid on time

Project Proposal:

Mr. Ramesh Kumar seeks a term loan of ₹5,00,000 from a cooperative bank to establish a small dairy unit with **5 crossbred milch cows** for milk production and marketing.

Technical Appraisal

- **Project Description:** The project involves construction of a cowshed, purchase of 5 cows, feed storage, and installation of basic dairy equipment.
- **Inputs Required:** Quality crossbred cows, fodder production on-farm, veterinary services, and labour availability.
- **Assessment:** The project is technically feasible as all inputs are locally available, and the borrower has prior experience in livestock rearing.

Financial Appraisal

Particulars	Amount (₹)
Cost of 5 cows	3,00,000
Cowshed construction	1,00,000
Feed and fodder (initial)	50,000
Equipment and miscellaneous	50,000
Total Project Cost	5,00,000

- **Expected Annual Income:** ₹3,60,000 (sale of milk and manure)
- **Annual Operating Cost:** ₹2,20,000
- **Net Annual Income:** ₹1,40,000
- **Repayment Capacity:** Sufficient to repay loan in 5 years with annual instalments of around ₹1,10,000 (including interest).

The project shows a **Benefit-Cost Ratio (BCR)** of 1.6, indicating financial viability.

Economic Appraisal

The dairy project will generate additional family income, create employment opportunities, and contribute to nutritional security in the village. Surplus milk can be sold to nearby milk cooperatives, strengthening the rural dairy economy.

Managerial and Market Appraisal

Mr. Ramesh has relevant experience in livestock management and access to veterinary services. The local milk cooperative guarantees regular procurement, ensuring a stable market for milk sales.

Risk Analysis

Risks include disease outbreaks, price fluctuations, and feed shortages. However, insurance coverage, forward contracts with the cooperative, and on-farm fodder production help minimize these risks.

Conclusion and Recommendations

Based on the appraisal, Mr. Ramesh Kumar's loan proposal is found to be **technically feasible, financially viable, economically beneficial, and managerially sound**. The project demonstrates strong repayment capacity and manageable risks. Therefore, the loan of ₹5,00,000 may be sanctioned with a repayment period of **5 years**, including a **grace period of 6 months**.

Final Remarks

Loan appraisal is not merely a formality but a crucial step in agricultural credit management. By thoroughly evaluating the technical, financial, economic, and managerial aspects of a project, financial institutions can ensure that loans are used productively and that repayment is secured. This case study illustrates how a systematic appraisal leads to informed lending decisions, promoting both farmer prosperity and financial sustainability.

Experiment 10: Techno Economic parameters of project preparation

Project evaluation technique

Capital Budgeting (Investment Analysis): Capital budgeting is the method of evaluating investment expectations. An investment is defined as the commitment of resources (capital) to production activities which yield returns over a reasonably long period of time. Simple cost return analysis is sufficient to ascertain the profitability of enterprises where the capital spent yields returns within a short period of time (say a year). But in the case of investments requiring commitment of capital for longer periods of time, the cost - return analysis will not be a sufficient measure of profitability. Such investments need to be evaluated for their economic viability using appropriate criteria. This is essential as the substantial capital committed will have long term consequences and is difficult to reverse the investment decisions once made.

Steps in capital budgeting: Capital budgeting consists of an orderly sequence of steps or actions that provide information relevant to an investment choice. These steps are (a) Identification (b) Formulation (c) Appraisal (d) implementation (e) Monitoring and (f) Evaluation.

1. Identification refers to recognition of farmer's needs. It is searching for profitable investments and is an important and continuous function of management.
2. Formulation is the detailed preparation of a plan for the identified project, which includes (a) location of the project (b) Size and number of units (c) Value of investment (d) Technical aspects (e) Economic aspects. The detailed project planning is generally preceded by a feasibility study (in the case of macro projects).
3. Appraisal is the critical review of the project proposed to assess the appropriateness and soundness of the project. Broadly four types of appraisal may be conducted, viz., Technical appraisal, financial appraisal, Economic appraisal and organizational appraisal. The project is appraised using different criteria.
4. Implementation refers to translating the investment proposal into a concrete project. It refers to putting the plan into action. Though an administrative aspect, implementation is a more crucial aspect as the anticipated costs, returns and time depend on effective implementation.
5. Monitoring is the process which is concerned with supervising and watching the project to see whether its implementation is as per plan. This helps to identify and diagnose the problems and to modify the project design, if necessary, for improving the performance of the project.
6. Evaluation: This is an analytical process for systematically and objectively pursuing the relevance, efficacy and effectiveness of the project activities in the light of the objectives set earlier. By evaluating the project, one can find its achievements and weaknesses so as to suggest ways of overcoming such weaknesses in future projects. The different types of evaluation are ex-ante evaluation, concurrent evaluation and ex-post/end evaluation.

DISCOUNTED MEASURES: Discounted cash flow technique is employed as a tool in evaluating long-term projects in agriculture. Hence, for evaluating the investments and to find out the technical feasibility and economic viability of investments on agricultural, irrigation

and plantation crops, a few measures of project evaluation (discounted cash flow techniques except Payback period) were used. These measures are advocated as tools or aid to evaluate and find out the worthiness of an investment, especially those of long term projects.

The measure used in the analysis were, Net Present Value (NPV), Benefit Cost Ratio (B: C ratio), Internal Rate of Returns (IRR). These discounted cash flows are the best estimates to decide on the worth of the project. This approach will give the net present worth of the project. The present worth of the costs is subtracted from the present worth of the benefits in order to arrive at the net present worth of the project every year.

NET PRESENT VALUE

The net present value is simply the present worth of net benefit of a project discounted at the opportunity cost of capital. This criterion ranks the investments for selecting the best alternatives. Generally, higher the net present worth better would be the preference. In computing net present worth, the difference between the present values of the cost were considered at a discount rate of 9.5 per cent as this is the present prevailing bank rate of interest on fixed capital. The general verbal and mathematical form of net present worth criterion is presented below.

This is simply the present worth of the cash flow stream. Sometimes, it is referred to as Net Present Value (NPV). The selection criterion of the project depends on positive value of NPW when discounted at the opportunity cost of the capital. This could be satisfactorily done, provided there is a correct estimate of opportunity cost of capital. NPW is an absolute measure, but not relative.

NPV = [Present worth of benefits] - [Present worth of costs]

$$NPV = \sum_{r=1}^n \frac{(B_n - C_n)}{(1 + d)^n}$$

Where,

B_n = Benefits in nth Year

C_n = Costs in nth year

n = Number of years

d = Discount rate

OR

$$NPV = [\sum_{I=1}^n Y_n(1 + r)^{-n}] - I_0$$

Where,

Y_n = Net cash inflows in the nth year

I_0 = Initial investment

i = Number of years

r = Discount factor (%)

In order to select worthiness of the project, the net present value should be positive.

NPV of the project is estimated using the following equation,

$$NPV = \frac{Y_1}{(1+i)^{t1}} + \frac{Y_2}{(1+i)^{t2}} + \dots + \frac{Y_n}{(1+i)^{tn}} - C$$

Where,

Y_1 : Net cash flow in first year,

i = Discount rate (%),

t = Time period, and

C = Initial cost of the investment.

The decision criteria are:

If $NPV > 0$: Investment is profitable and project is said to be financially feasible/ worthwhile

If $NPV < 0$: Investment is not profitable and the project is not worthwhile/ infeasible

If $NPV = 0$: Indifferent case. The project may or may not be taken.

It possesses the additive property / aggregate of different projects. It concerns with the financial objective of maximization of wealth of stockholders. It considers all the cash flows in its entirety. It takes into account of time value of time. Ranking of the projects are not correctly done.

Study Questions:

1. Calculate the NPV for the following cash flow stream of a project:

(Assume that the cost of capital (discount rate) for the firm is 12%).

Net cash investment	Year	Cash inflow	Discount rate@ 12%	Discounted value of cash flow (in Rs.)
10,000	0	----	-----	
	1	2,000		
	2	3,000		

	3	3,000		
	4	3,000		
3,000	5	3,000		
	Total Present Value of the earning (cash inflow) =			

NPV = Present value of cash inflow – present value of cash outflow =

2. Calculate the NPV for the following cash flow stream of a project

(Assume that the cost of capital (discount rate) for the firm is 10 percent)

Net investment	Cash	Year	Cash flow (in Rs)	Discount factor@10%	Discounted value cash flow (in Rs)
1200		0	-----	-----	
		1	500		
		2	500		
		3	300		
		4	300		
		Total Present Value of the Earnings (cash Inflow) =			

NPV = Present value inflow – Present value of cash outflow =

3. Project A required an investment of of Rs.400 and was expected to have cash inflow of Rs.110, Rs.120, Rs.130, Rs.140 and Rs.150 over it 5 years economic life. Project B involved an investment of Rs. 300 and was expected to have a cash inflow of Rs. 100 each its five years economic life. Which of the two projects will you select if cost of capital is (i) 10 percent and (ii) 12 percent?

Experiment No.11: Preparation of project proposal for poultry activity

Bank extends loan assistance to take up various types of poultry development activities through its general schemes. These schemes are aimed at helping the beneficiaries to take up economic activities and also to help increase egg, meat, and chick production in the country.

A farmer in Dharwad district of Karnataka State wants to start the broiler production unit before starting, he would like to know the technical and economic feasibility of the project. In assessing the economic and technical feasibility of a broiler project, the suitability or availability of the following may be looked into:

I. Technical aspects:

1. Location of farm (temperature-not exceeding 105° F (40° C).

i. Land to construct the poultry shed and other structures-direction of sheds distance between sheds, material for construction

ii. Area should be free from drafty winds and water logging conditions.

iii. Adequate fresh water and electricity supply,

iv. Nearness to all weather roads

v. Supply of one-day old chicks and feed;

vi. Nearness to sources of supply of chicks and poultry feed

vii. Experienced staff and labor for farm management;

viii. Veterinary services for the birds, and

ix. Ancillary facilities for shed construction, well digging and installation of electrical and water fixture.

x. New poultry farms may be one Km away from the existing farms/ complexes.

2. The following factors are, however, important in determining the income from broiler production:

i. Capital investment: It varies with the type and cost of building materials, the location of farm and the rate of interest on capital investment.

ii. Manpower. The wage rate of labor and other supervisory staff.

iii. Inputs: The quality and cost of day-old chicks as well as of poultry feed. All inputs can be easily made available and a system of regular collection of eggs from the door steps of the dairy farmers and transporting them to marketing centers should either exist or can be organized.

ii. Output: The weight attained at marketable age of table birds, mortality rates under efficient management conditions.

iii. Marketing: The market price of table birds which the producer gets after paying the commission to the whole sale agents, freight charges, market fee, etc.

II. Financial Aspects:

Sl. No.	Particulars	Amount (in Rs)
A.	Layer farming- _____ Layer unit (deep litter: _____)	
i.	Cost of brooder sheds	
ii.	Cost of _____ layers sheds	
iii.	Brooder / Grower equipment	
iv.	Layer equipment of _____ birds	
v.	Feed store _____ sft	
vi.	Point of lay	
	A.	
	b.	
	c.	
	e.	
B.	Broilers- _____ birds	
i.	Cost of shed _____ sq. ft.	
ii.	Cost of _____ DOC	
iii.	Equipment@	
iv.	Fed cost for _____ birds	
v.	Miscellaneous cost @ Rs _____	
vi.	Insurance @ Rs _____	
	Total	

Total receipt includes income realized from sale of eggs, chicks/ broilers, etc.

$$\text{Net cash inflows} = \text{Total receipt} - \text{Total expenses}$$

Preparation of project proposal for fisheries

Fishery development is an important activity allied to agriculture. There are two types of fishing-Inland and marine fishing.

- I. Technical aspects: The Fish farming Development Agency render assistance to farmers in allotment of ponds, supply of seeds, extension services, supply of inputs, training and subsidy etc.
 - i. Digging/ developing new ponds/ renovating old ponds
 - ii. Weed clearance
 - iii. Fish grow healthy and vigorously in alkaline water.
 - iv. Inorganic and organic manures shall be applied 20days before stocking of fish per hectare. (Ammonium sulphate, SSP, FYM)
 - v. Cost of fish seed
 - vi. Supplementary feed in nature of till / groundnut/ mustard/ coconut cake and deal wheat bran shall be applied.
- A. Yield: body weight of 700- 1000 mg in one year.
- B. Harvesting needs: Net used in small water area & net and small boat used in large water area
- C. Market: study market, transportation. Use of ice for transport and storage
- D. Brackish water prawn / fish culture Production: monoculture-prawn: 300-600kg/ha/crop & polyculture-prawn: 500-750kg/ha/crop and 1200 to 1900 kg. fish
 - a. Investment: tank/pond, Pump set, weed clearance first time, liming first time, feed first time, organic manure and inorganic fertilizers first time and fishing operations
 - b. Current expenditure: chowkidar /watching, weed clearance, manures, fwd, maintenance of tank, transport/ ice etc.
 - c. Income: sale of fish

Financial aspect: Includes fish nets, boats/ vessels etc.

Sl. No	Particulars	Amounts (in Rs)
A.	Fish culture in low lying areas (size of pond -4 or 5 feet excavation):	
	i. Capital	
	ii. Operational cost	
B.	Fish culture in areas requiring (5 feet excavation):	
	a. Capital cost	
	b. Operational cost	
C.	Pig-cum-fish-culture	
	a. Capital cost	
	i. For excavation of pond	
	ii. Pig sty construction	
	b. Operational cost	
	i. For one crop of fish	
	ii. For rearing one lot of piglets for 6 months Pig sty. construction	
D.	Fish culture in water logged areas	
	a. Capital cost	
	b. Operational cost	
	Total	

Preparation of project proposal for agro-based industries

India is one of the leading producers of horticultural crops in the country. The industry policy identifies the agro industrial sector as the major thrust area. The India has made advances in agricultural production and how moving into high- tech agriculture.

Presently, there is low value addition in India in comparison to other country and significantly lower than China, Philippines and UK. The low value addition inhibits industry to achieve economic scale of agro processing resulting in higher per unit cost of production.

- I. Technical aspects
 1. Selection of site and building
 - a. Location close to raw material production
 2. Technology Know- how
 - a. Indigenous
 - b. Trail production result
 3. Selection of machinery
 - a. Machinery suitability of the process
 4. Availability of raw material and seasonal
 - a. Tie up with farmers
 - b. Area development

- c. Continuous availability
 - 5. Availability of power
 - 6. Fuel & power
 - 7. Background of promoter
 - 8. Experience of consultant
 - 9. Pollution norms
 - 10. Market- domestic and export
- I. Financial Aspects: Financial viability of the project will be evaluated by using NPV, PBP, BCR and IRR.

Sl. No	Particulars	Amount (in Rs)
A.	Cost Of building (land value)	
B.	Cost of machinery	
C.	Cost of fuel & power/ electricity bill	
D.	Cost of raw material	
	TOTAL EXPENSES	
	Total receipt include income realized from sale of finished products, etc,	
	Net cash flows= Total receipt – Total expenses	