

17  
**Practical Manual**

**on**

**Agricultural Finance & Cooperation**

Prepared by :

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**Department of Agricultural Economics**

**College of Agriculture**

**INDIRA GANDHI KRISHI VISHWAVIDYALAYA**

**Raipur (Chhattisgarh) 492 012**

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## **CERTIFICATE**

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## **Practical No. - 1**

**Title: TOOLS OF FINANCIAL ANALYSIS**

**Objectives: To assess the financial performances of farm business.**

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, break-even-analysis etc. are available to him in this regard. These tools are presented in this section.

### **1.1 Farm planning and budgeting:**

Farm planning and budgeting are the most important tools of farm business analysis. The most profitable alternative enterprises selected in the planning process by organizing the available land, labour and capital resources into proper combinations. A farm plan is a scheme for operation and organization 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 alternatives profitable enterprises and how limited capital and fixed family labour are most profitably combined in different period of time to produce desired crop and livestock products. 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.

### **1.2 Budgeting:**

In budgeting process, we estimate cost, 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 profit for the whole farm, then it is termed as complete budgeting. In this process, the best combination of enterprises is judged based on the productivity of the resources and ability of the farm operator to maximize the returns.

### **1.3 Balance sheet or net worth statement:**

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 benefit. The balance sheet can be easily prepared by the farmer in the presence of farm records.

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

(a.) *Current assets* – They are very liquid or short term assets. Example- Cash on hand, agricultural produce ready for disposal i.e. stocks of paddy, wheat etc.

(b.) *Intermediate or working assets*- these assets take two to five years to convert into cash form. Examples- Machinery, equipment, livestock 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. Example- Land, farm buildings etc.

**Liabilities:** These refers to all things which are owned to others by the farmers.

(a.) *Current liabilities*- Debts that must to be paid to the short term. Examples- Crop loans, cost of maintenance of cattle etc.

(b.) *Intermediate liabilities*- These loans are due for the repayment within period of two to five years. Examples-Livestock loans, machinery loans etc.

(c.) *Long term liabilities*- The duration of loan repayment is more than 5 years. Examples- Tractor loan, orchard loan etc.

### Exercise – 1: Balance Sheet of a Farm

Assets	Amount (Rs.)	Liabilities	Amount (Rs.)
<b>1. Current assets</b>		<b>1. Current liabilities</b>	
(a.) Saving in bank		(a.) Cost of cultivation (excluding loans)	
(b.) Cash on hand		(b.) Crop loan to be repaid to different agencies	
(c.) Value of crops ready for disposal		(c.) Cost of maintenance of cattle	
(d.) Livestock products (including eggs, birds etc.)		(d.) Cost in poultry enterprises	
(e.) Fruits, vegetables		(e.) Other loan (un-secured loans due for immediate repayment)	
(f.) Fodder and feed ready for sale		(f.) Annual installment	
(g.) Value of bonds and shares to be realized in the same years		(g.) Other dues	
(h.) Others			

<b>Sub-total</b>		<b>Sub-total</b>	
<b>2. Intermediate assets</b>		<b>2. Intermediate liabilities</b>	
(a.) Dairy cattle		(a.) Livestock loans	
(b.) Bullocks		(b.) Machinery loans	
(c.) Poultry birds		(c.) Unsecured loans	
(d.) Pigs		(d.) Others	
(e.) Machinery and equipments			
(f.) Tractor			
(g.) Others			
<b>Sub-total</b>		<b>Sub-total</b>	
<b>3. Long term assets</b>		<b>3. Long term liabilities</b>	
(a.) Land (value)		(a.) Tractor loans	
(b.) Farm buildings		(b.) Orchard loans	
		(c.) Unsecured loans	
		(d.) Others	
<b>Sub-total</b>		<b>Sub-total</b>	
<b>Total assets</b>		<b>Total of liabilities</b>	
		Net worth or equity = Total assets – Total liabilities	

#### 1.4 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.

$$1. \text{ Current ratio} = \frac{\text{Total current assets}}{\text{Total current liabilities}}$$

Comments/Results :

$$2. \text{ Intermediate ratio} = \frac{\text{Total current assets} + \text{Total intermediate assets}}{\text{Total current liabilities} + \text{Total intermediate liabilities}}$$

or working ratio

Comments/Results :

$$3. \text{ Net capital ratio} = \frac{\text{Total assets}}{\text{Total liabilities}}$$



Comments/Results :

$$4. \text{ Current liability ratio} = \frac{\text{Current liabilities}}{\text{Owner's equity or net worth}}$$

Comments/Results :

**Exercise-2: A comparative balance sheet of a farm is given here with the help of the following information calculate the solvency and liquidity ratio.**

Items	Years			
	2004	2005	2006	2007
1. Bank deposits				
2. Currency/inventories				
3. Supplies				
<b>Total current assets</b>				
4. Household furnishing equipments				
5. Machinery & equipments				
<b>Total medium term assets</b>				
6. Long term assets				
<b>Total assets</b>				
<b>Liabilities</b>				
Operating balance				
Medium term loan				
Long term loan				
Contingencies liabilities				
<b>Total liabilities</b>				
<b>Net worth (owner's equity)</b>				

$$5. \text{ Acid test ratio or quick ration} = \frac{\text{Cash receipts + accounts receivable + marketable securities (bonds shares etc.) available in more than one year}}{\text{Total current liabilities}}$$

Comments/Results :

$$6. \text{ Deb-equity ration (Leverage ration)} = \frac{\text{Total debts}}{\text{Owner's equity}}$$

Comments/Results :

7. Equity value ration

= -----

Owner's equity

Value of assets

Comments/Results :

### 1.5 Income statement or profit and loss statement:

Income statement is 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 output. 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. Income statement basically constitutes three items, viz. receipts, expenses and net income.

**Receipts:** They mean the returns obtained from the sale of crop produce and other supplementary products like milk, eggs, wages, gifts etc. Gain in the form of appreciation in the value of assets is also included in the receipts.

**Expenses:** Operating and fixed costs are recorded here. Losses in the form of depreciation on the asset value fall under the expenditure items.

**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 during the period for which income statement is prepared.

**Net operating income:** It is arrived at by deducting operating expenses from the gross income.

**Net farm income:** Net farm income equals net operating income less fixed costs. It is the return accrued to owned capital and family labour employed.

### Exercise-3: Income statement of a farm

S.No.	Particulars	Amount (In Rs.)
<b>I.</b>	<b>Receipts</b>	
a.	Returns from the sale of crop output (paddy+pulses etc.)	
b.	Revenue from milk and milk products Returns from poultry enterprises Returns from supplementary enterprises	
c.	Gifts	
d.	Gross cash income	
e.	Appreciation on the value of assets	
f.	Other income	
g.	Gross income	
<b>II.</b>	<b>Expenses – Operating expenses or costs</b>	
a.	Hired human labour	
b.	Bullock labour	
c.	Machine power	
d.	Seeds	
e.	Feeds	
f.	Manures and fertilizers	
g.	Plant protection measures	
h.	Veterinary aid	
i.	Irrigation	
j.	Miscellaneous	
k.	Interest on working capital	
	Total operating expenses	
	Fixed expenses or costs	
a.	Depreciation	
b.	Land revenue	
c.	Interest on fixed capital	
d.	Rental value of owned land	
e.	Others	
f.	Total fixed costs	
<b>III.</b>	Net cash income (Gross income (excluding appreciation item) – Total operating expenses)	
<b>IV.</b>	Net operating income (Gross income – Total operating expenses)	
<b>V.</b>	Net farm income (Net operating income – Total fixed costs)	

**Exercise 4 : With the help of following information (income statement)  
calculate the financial test ratios**

Receipts		Expenditure	
Particulars	Value (Rs.)	Particulars	Value (Rs.)
<b>A. Crops</b>		<b>A. Operating expenses</b>	
Wheat		Seed	
Gram		Fertilizer	
Paddy		Irrigation charges	
Minor millets		Interest on operating loan	
Sugarcane		Charges of machinery and power	
Others		Others	
Sub-total		Sub-total	
<b>B. Livestock</b>		<b>B. Fixed expenses</b>	
Bullock		Tax	
Cow		Interest on medium and long term loan	
Milk		Repair and maintenance	
		Depreciation	
		Insurance charges	
		Others	
Total		Total	

**1.6 Financial test ration:**

Two set of income ratios can be developed one is directly from the income and expenditure pattern and another by taking are 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.

Following are the ratios which can be obtained directly from the income statement.

$$1. \text{ Operating ratio} = \frac{\text{Total operating expenses}}{\text{Gross income}}$$

Comments/results

Fixed expenses

2. Fixed ratio =  $\frac{\text{-----}}{\text{Gross income}}$

Comments/results

3. Gross ratio =  $\frac{\text{Total expenses}}{\text{-----}} \frac{\text{-----}}{\text{Gross income}}$

Comments/results

4. Capital turn over ratio =  $\frac{\text{Gross income}}{\text{-----}} \frac{\text{-----}}{\text{Average capital investment}}$

Comments/results

5. Rate of return on investment =  $\frac{\text{Net return to capital}}{\text{-----}} \frac{\text{-----}}{\text{Average capital investment}}$

### 1.7 Management ratios:

These ratios also measure the productivity of farm business.

1. **Management return :** It is derived by deducting unpaid family labour wages and interest on owned capital from net farm income.
2. **Crop yields and value:** This is worked out by comparing the yields obtained by the farmers for different crops with those of average yield of the area.
3. **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.
4. **Gross income per man:** It is simply knowing the labour efficiency by taking into account the number of labourers employed.
5. **Gross income per rupee investment:** This is simply an input-output ratio. A progressively higher ratio over the years reflects a better run of the business.

### 1.8 Cash flow statement:

Cash flow statement, is a summary of cash inflows and cash out flows of a business organization in a particular period, say a season or year. 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 head of sale and purchase of capital assets, the time and quantum of repayment etc.

**Exercise-5: Cash flow statement of a farm**

S. No.	Particulars	I quarter (Jun-Aug)	II quarter (Sep-Nov)	III quarter (Dec-Feb)	IV quarter (Mar-May)	Total
<b>I.</b>	<b>Cash receipts (in Rs.)</b>					
a.	Cash balance (Brought forward from previous year)					
b.	Total operating sales (Farm and livestock etc. products)					
c.	Total capital sales (Milch cattle)					
d.	Net farm income (Family members workings elsewhere)					
e.	Borrowings (Short, medium and long term loan)					
f.	Total					

Contd...

**Exercise-5: Cash flow statement of a farm**

S. No.	Particulars	I quarter (Jun-Aug)	II quarter (Sep-Nov)	III quarter (Dec-Feb)	IV quarter (Mar-May)	Total
<b>II.</b>	<b>Cash expenses (in Rs.)</b>					
a.	Operating expenses (Expenditure on crop and livestocks)					
b.	Capital investment (Purchase of milch cattle)					
c.	Family living					
d.	Payment of previous years debt					
e.	Payment of short term loans and installments on investment loans					
	Total					
<b>III.</b>	Cash balance (Cash receipts – cash expenses)					

### **Advantages of cash flow budget:**

Cash flow budget helps in –

- (i.) To estimate the total credit needs 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 farmers can keep limits to avoid wastage.
- (vi.) The farmer to exercise a check on farm costs.
- (vii.) The farmers in preparing the farm business plans for the ensuing years.
- (viii.) The banker for revising the scale of finance, rescheduling loans etc.
- (ix.) Finally, as a tool of financial control to the farmer.

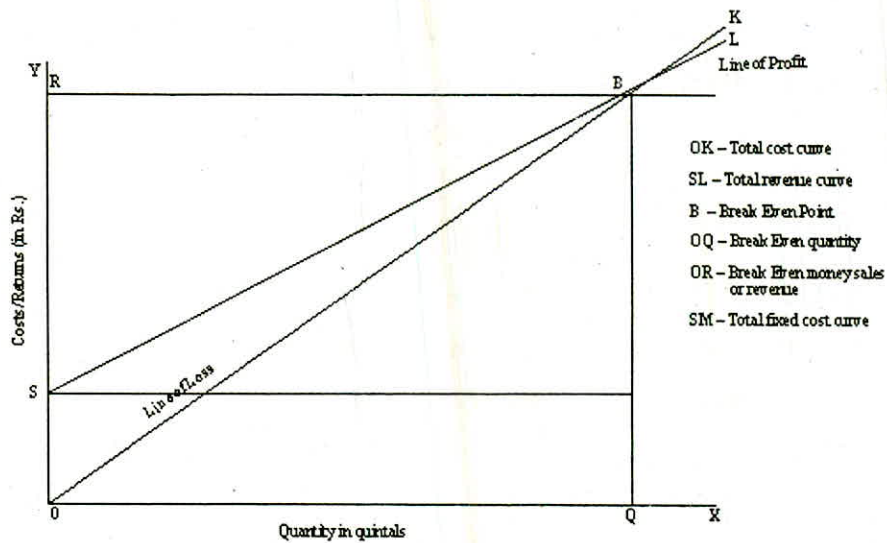
### **1.9 Break-Even Analysis:**

The point at which the two curves, ie. 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 losses 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 Break-Even Point.

There are two approaches in Break-Even Analysis.

#### **a. Linear approach:**

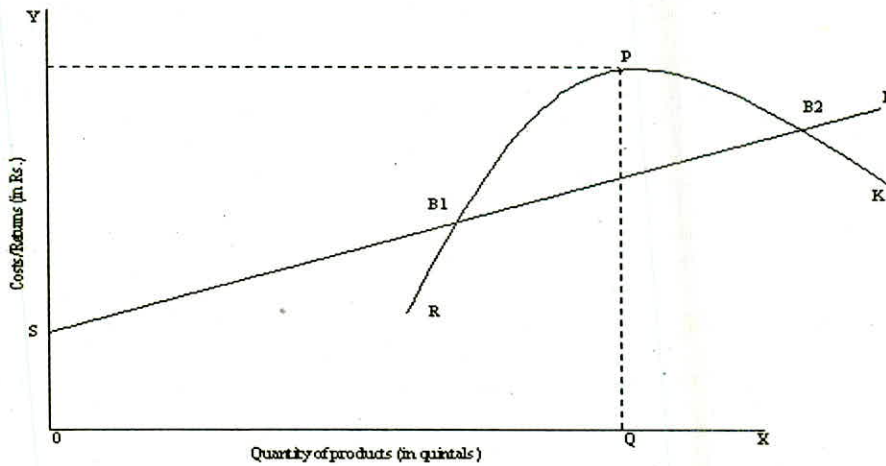
Here the total cost curve as well as total revenue curve are linear. The total revenue curve is a straight line, since the price is supposed to be constant at all quantities of output sales. The point at which the two curves intersect is the Break-Even Point (B) as indicated in figure.



**Fig. A linear break-even diagram**

**b. Curvilinear approach:**

Here, the total curve, it is a straight line and revenue curve, RK having curvature which is concave downwards, are shown in figure-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. 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 BEP can be calculated with the following algebraic method.



**Fig. Curvilinear break-even diagram.**



$$\text{Break-Even Point (BEP)} = \frac{F}{(P-V)}$$

Where,

F = Fixed costs in Rs. Per hectare of ----- crop

P = Price per quintal of ----- in Rupees.

V = Variable cost per quintal of ----- in Rupees.

**c. Computation of BEP in monetary value**

$$\text{Break-Even Point (BEP)} = \frac{F}{(1-V/P)}$$

**Exercise-6:** Break-even output in ----- cultivation.

S.No.	Particulars	Small	Medium	Large
1.	Fixed cost (Rs.)			
2.	Variable cost (Rs.)			
3.	Total cost (Rs.)			
4.	Price per quintal			
5.	Value of output			
6.	Total revenue			
7.	BEB output (Q.)			
8.	BEP in monetary value			

The break-even analysis will also facilitate in computation of certain measures, viz. margin of safety and percentage of margin of safety which helps in decision making.

**1.10 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.

Margin of safety (in units) = Total output – Output at BEP

Margin of safety = Total revenue – Revenue at BEP

Percentage of margin of safety =  $\frac{\text{BEP Output}}{\text{Volume of output}} \times 100$

## Practical No. - 2

**Title: Farm firm growth and financial leverage:**

**Objective: To assess the farm firm growth**

The term growth is used in financial management, generally refers to increase in the size of an agricultural business or farm-firm. The rates of growth refers to the changing size of farm business or firm overtime. Financial leverage refers to the use of borrowed funds to supplement the equity capital. The following mathematical model describe the combined effects of return as capital investment, cost of non-equity capital, leverage and consumption as the rate of farm-firm growth. Let profits or net income identities be defined as:

$$P = (r A - iD) \dots\dots\dots(1)$$

Where,

- P = Profits or net income available for consumption or saving
- A = Total assets.
- D = Total liabilities.
- r = The net rate of return (except for interest 'i' and on total assets in the farm-firm) on total capital investment.
- i = Cost of non-equity financing (average interest rate paid on debt).

When some of the profit are withdrawn for consumption, the saving growth in equity is expressed as:

$$E \text{ or } S \text{ or } G = (r A - i D) (1-C) \dots\dots\dots(2)$$

G = Saving or growth in equity

C = Farmer's withdrawals for family consumption or other off-farm flows.

The rate of growth in equity is then expressed as:

$$G = \frac{\Delta E}{\dots\dots\dots} \left[ \frac{r A - i D}{\dots\dots\dots} \right] (1 - C) \dots\dots\dots(3)$$

$$E \quad \_ \quad E \quad \_$$

Where,

G = The growth rate (the annual percentage change in equity)

E = Equity or networth

ΔE = Change in equity

The equation 3 combines balance sheet (A,D,E) and income statement (r,i) elements and also specifies a rate of reinvestment through consumption withdrawals, since,

A = D + E, the equation (3) can be written as

$$G = \frac{\Delta E}{E} \left[ \frac{r(D+E) - iD}{E} \right] (1-C) \dots\dots\dots(4)$$

OR

$$G = \frac{\Delta E}{E} \frac{[rD - iD + r]}{E} (1-C)$$

OR

$$G = \frac{\Delta E}{E} \left[ \frac{D}{E} (r-i) + r \right] (1-C)$$

To measure the impact of higher financial leverage ratios on the farm firm growth equation modified to directly incorporate the leverage ratio, since D/E = L (the leverage ratio or debt to equity ratio).

$$G = [L(r-i) + r] (1-C) \dots\dots\dots(5)$$

In the absence of credit, the leverage ratios equal to zero and equation 5 reduces to :

$$G = r(1-C) \dots\dots\dots(6)$$

The relationship between farm-firm growth, financial leverage and rate of return becomes clearer when we assign numerical values to the variables of equation 5.

**Exercise-7: The farm-firm growth rates (in annual percentages) as specified by the financial leverage (L) and rate of return (r)\***

L/r	0.10	0.15	0.20	0.25	0.30	0.35	0.40
0.00	2.50	3.75	5.00	6.25	7.50	8.75	10.00
0.50	2.50	6.25	10.00	13.75	17.50	21.25	25.00
1.00	2.50	8.75	15.00	21.15	27.50	33.75	40.00
2.00	2.50	13.75	25.00	36.25	47.50	58.75	70.00
2.50	2.50	16.25	30.00	43.75	57.50	71.25	85.00
3.00	2.50	18.75	35.00	51.25	67.50	83.75	100.00

\* Assuming a farm family consumes 75 percent of its net farm income and the interest rate on borrowed capital is 10 percent.

**2.1 External credit rationing:**

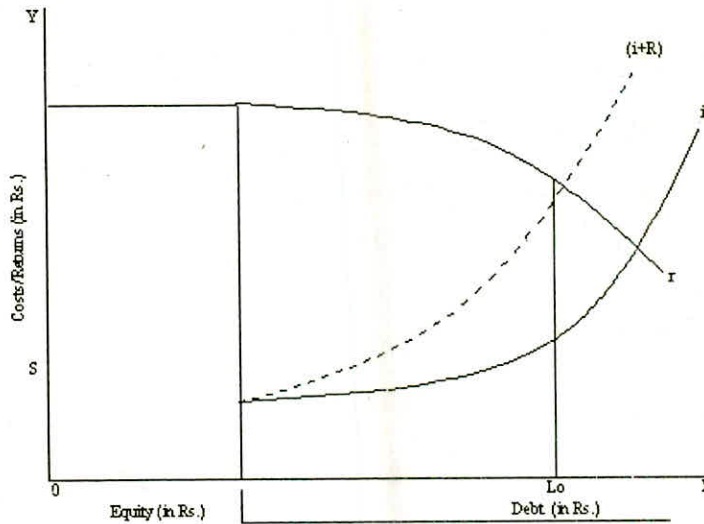
a. **Quantity rationing of credit use:** Lenders usually fix the maximum credit limits i.e. a ceiling on loan amounts which they are willing to extend as a consequences the credit capacity retards the rate of farm-firm growth.

b. **Price rationing of credit use:** The lender can also increase the interest rate which increases the cost of borrowing the debt capital and acts as an external credit rationing in the use of credit.

**2.2 Internal credit rationing:**

c. **Quantity rationing of credit use:** The farmer may also ration the use of credit due to liquidity reasons, financial risk is associated with "Over extending" the use of debt in relation to equity or high interest rate, which also affects substantially the rate of growth in owner's equity.

d. **Income distribution:** The farmer can also withdrawal higher farm incomes to meet his personal consumption expenditure and thereby the retained farm earning would be reduced.



**Fig. Equilibrium in the use of financial leverage**

$r$  = Shows the divining marginal productivity of total capital

$i$  = Reflects external capital rationing.

$i - r$  = Combined of external and internal rationing.

$Lo$  = Optimum degree of leverage.

$I+R$  = Interest  $r$  – use of leverage is maximize.

**Exercise- 8:**

Given with the following in formation about firm estimate the following:

**Part-A**

- (i.) What is the maximum rate at which the firm could grow?
- (ii.) What leverage ratio must this farmer/firm achieve in order to grow at 25 percent?
- (iii.) To grow at 30% rate or to achieve a growth rate of 30% by what rate consumption expenditure should be cut down?
- (iv.) What would be the impact on growth rate if tax rate is brought down to 15%?

**Data:**

- (a.) Total assets Rs.2,00,000.00
- (b.) Total debt Rs.80,000.00
- (c.) Rate of return on borrowing capital @15%

- (d.) Rate of return on capital @20%
- (e.) Family consumption rate 50%
- (f.) Tax rate 20%

**Formula:** Growth rate  $g = [r + L (r - i)] (1-t) (1-C)$

Where,

- r = Rate of return on capital
- L = Leverage = Total assets/Total liabilities
- i = Rate of return on borrowing capital
- t = Tax rate
- C = Consumption rate

### Part-B

A farmer has Rs. One lakh equity capital. He can either borrow Rs. One lakh @10% interest rate or Rs. Two lakhs at the rate of 11%. He can earn 13% on total capital up to Rs. 4 lakhs. The farmer desire to grow as rapidly as possible. The farmer should select which borrowing option out of these two if the tax rate and consumption rate is same as given in part A.

### Exercise-9:

Four farmers wanted to invest their business with the owners equity of Rs.50,000 but the first one farmer would not like to borrow only amount he want to invest only his owner's equity whereas second are want to borrow only upto 0.50 leverage whereas the third are wants to borrowed equal amount of owners equity and fourth one want to borrowed double amount of his owner's equity, if the return on total asset @12% and the cost of borrowing is 6% (1) they have to pay 20% as net return. With the help of this in formation calculate rate earned on equity capital in case there is loss @12%. What will be the loss of owner equity in terms of percentage.

## Practical No. - 3

**Title:** Computing interest rate.

**Objective:** To calculate the interstate

### 3.1 Simple Interest

The simple interest is the product of principal, the time in years and the annual rate of interest, for example, the interest of Rs.2000 for one year with 10 percent rate of interest equals Rs.200 and only one payment of interest is made when loan matures.

### 3.2 Compound Interest

In this case the interest is periodically converted in to the principal i.e. annually, biannually, quarterly etc. The interval between successive conversion is called the conversion period and amount due at its end is called the compound amount. The compound interest is difference between the compound amount and the beginning principle while compound interest rate is the rate per conversion period charged on outstanding balance at the beginning of that period.

### 3.3 Method of calculation the nominal interest rate:

The nominal annual rate or nominal rate is the periodic rate converted on an annual basis. On the contrary, the rate of interest actually earned per annum called the effective annual rate and is obtained by compounding the true rate for a period of one year.

### Methods:

#### (I.) The constant equation ration:

It can be used to approximate the nominal interest rate when other terms are none.

It can be calculated as = 
$$\frac{2In}{Bt(n-1)} = \text{Approximate NDR}$$

Where,

I or interest or finance charged.

n = Number of periodic payment required to liquidate the loan.

B = Beginning principal (face amount)

t = Term of the loaning years.



The constant ratio equation is based on the assumption that the ratio of the interest in each periodic payment is the same as the ratio of initial principal to the total interest or finance charge (Applicable on add on interest plan).

**(II.) Stelson equation:**

This is more accurate equation in comparison to constant equation ratio.

Formulae:

$$\frac{2 I m}{n (B+a) t} \quad \frac{2 I}{(B+a)} = \text{Approximate nominal interest rate}$$

where,

m = Number of payment in year

a = Amount of each periodic payment

$$a = \frac{B + I}{n}$$

According to this equation they will be closer approximate to the nominal interest rate, however the rate will be in the higher side.

**(III.) Direct ratio equation:**

It is very close approximation of nominal 'i' assumes that the amount of i in each installment is distributed according to sum of the digits for example in a 12 months installment the first installment is assume to income 12/78 of the total interest the second installment is 11/78 ..... 1/78.

$$\text{Formula} = \frac{6 I m}{3B (n+1) + (n-1) I}$$

The rate will be slightly lower side.

**(IV.) Modified Direct Ratio equation:**

Formulae:

$$\frac{2 I}{\left[ \frac{3B(n+1) + (2n+2) I}{\text{-----}} \right] X m}$$

$$B(n+1) \quad \frac{3B(n+1) + (2n+1)I}{- \quad -}$$

**(V.) Equal Payment, Irregularly Timed Loan:**

Formulae:

$$\frac{6 I m}{3n (B+a) + I (n - 4)}$$

**Exercise-10:**

Compute the approximate using different methods for an add on interest plan taken by a farmer to purchase a tractor under the world bank scheme the required information is given below:

S.No.	Particulars	Farm-A	Farm-B
1.	Actual nominal rate of interest	12%	12%
2.	Face value of the loan (B)	1.25 lakh	50,000
3.	Total finance charges (I)	1.35 lakh	26,000
4.	No. of periodic payment (n)	18	10
5.	Terms of loan (t)	9	5
6.	No. of installment/year (m)	2	2
7.	Amount of each periodic payment a = B+I/n		

## Practical No. - 4

**Title: Estimation of Credit Requirement**

**Objectives: To estimate the credit requirement of farm firm.**

### CAPITAL REQUIREMENT

Requirement of capital as a factor input for a farm depends upon the relative supply of other farm resources, i.e. land and labour etc. The capital requirements also vary with type of farming and level of technology adopted on different farms.

In a resource-mix, if labour is in abundance and the level of technology being followed is low i.e. only traditional methods of cultivation such as ploughing with bullocks and harvesting with ordinary hand tools are followed, cultivation remains labour intensive and capital inputs remain low. As the scarcity of labour increases and production technology develops and improves, more and more capital is used in the production process.

Capital requirements are in fact both dependent upon and are determined by the farm organizations and the production technology that is adopted.

Type of farming has a tremendous influence on capital requirements. Ordinary arable farming, for example, will need less capital as compared to vegetable farming. Dairy farming would need less working capital because the recurring expenses such as feed and veterinary would be met through the regular flow of income from the sale of dairy products. But the initial investment in dairying has a high total capital requirements. Medium and long term capital needs would be much higher in this case as compared with arable farming.

According to farm plan credit requirement will be estimated:

#### Exercise-11:

##### Cost of cultivation:

Crops ----- Variety ----- Area (ha) -----  
Irrigated/unirrigated ----- Season : Kharif/Rabi/Summer -----

Particulars	Human labour		Bullock labour		Input	Remarks
	Owned	Hired	Owned	Hired		
Field preparation						
Manuring						
Sowing/Nursery						

Seed						
Transplanting/Biasi						
Fertilizers						
Interculture						
Irrigation						
Plant protection						
Harvesting						
Transportation						
Threshing/winnowing						
Marketing						
Others						

### Exercise-12:

#### Estimation of capital according to crop, area and seasons

Particulars	Amount (Rs.)	
	Owned	Credit
<b>Inputwise requirement</b>		
- Labour – Hired		
- Bullock labour – Hired		
- Machine power – Hired		
- Seed – Purchased		
- Fertilizers & manure – Purchased		
- Plant protection & chemical		
- Irrigation		
- Miscellaneous		
- Marketing		
<b>Total</b>		

### Exercise-13:

#### Estimation of credit for dairy units

Particulars	Amount (Rs.)	
	Owned	Credit
Cost of cattle		
Cost of bullock		
Cost of buffalo		
Chaffcutter		

Dairyshed		
Water & feed pot		
Miscellaneous		
<b>Cost of feeds -</b>		
- Green fodder		
- Dry fodder		
- Concentrate		
- Medicine		
- Electricity		
- Water		
- Labour		
- Milk marketing		
- Income statement		
- Sale of milk		
- Sale of manure		
<b>Total</b>		

**Exercise-14:**

**Estimation of cost of mango orchard**

Particulars	Year wise									
	I		II		III		IV		V	
<b>1. Land development</b>										
e. Uprooting of stables										
f. Leveling of land										
g. Formation of internal bunds and removal of stones.										
<b>2. Development of orchard</b>										
a. Preparation of land										
b. Digging of pits										

c. Filling back of pits										
d. Cost of mango grafts										
e. Plantation and staking										
f. Irrigation										
g. Manure & fertilizer										
h. Interculture										
i. Plant protection										
j. Intercrops										
k. Fencing										
l. Miscellaneous										
<b>3. Product</b>										

**Exercise-15:**

**Estimation of credit requirement for fish pond**

Particulars	Amount (Rs.)	
	Owned	Credit
1. Excavation of ponds		
2. Promising inlets/outlets with shutters		
3. Contingencies		
4. Miscellaneous		
5. Net		
6. Recurring expenditure		
- Cost lime		
- Cost of cowdung		
- Cost of fertilizers		
- N, P, K		
- Others		
- Cost of seed		
- Cost of seed, oil cake, rice bran		
- Salaries to watchman & other staffs		
- Harvesting charges		
- Rent		
- Insurance charges		
- Pump operation and maintenance		

**Exercise-16:**

**Estimation of loan required for a firm**

Particulars	Seasons			
	Kharif	Rabi	Summer	Total

1. Crop enterprise				
a. Total capital required (Rs.)				
(i.) Owned capital				
(ii.) Borrowed capital				
2. Allied enterprises				
Total capital required (Rs.)				
(i.) Owned capital				
(ii.) Borrowed capital				
3. Total				
Total capital required for a farm				
(i.) Owned capital				
(ii.) Borrowed capital				

### Exercise-17:

#### Economic feasibility tests of the farm credit proposal

Items	Plan without credit			Alternative plan with credit		
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
<b>A. Returns</b>						
(i.) Gross income						
(ii.) Total working expenses (Variable and annual fixed expenses)						
(iii.) Returns to fixed factors incremental income						
<b>B. Repayment capacity</b>						
(i.) Gross income						
(ii.) Working expenses (deduct)						
(iii.) Income from other sources (add)						
(iv.) Total family income						
(v.) Old debts/other loan installment (deduct)						
(vi.) Family living expenses (deduct)						
(vii.) Social obligation & unavoidable expenses						

– (deduct)						
(viii.) Repayment capacity						
<b>C. Risk bearing ability</b>						
(i.) Repayment capacity						
(ii.) Income variability (% of income against risk and uncertainty) – deduct						
(iii.) Net repayment capacity						

**Exercise-18:**

**Estimation of repayment capacity for self liquidating loan**

S.No.	Particulars	Amount (Rs.)	
		Without loan	With loan
1.	Gross returns	28,000	40,500
2.	Working expenses excluding crop loan	8,800	8,800
3.	Family living expenses	10,000	10,000
4.	Other loan due	4,000	4,000
5.	Miscellaneous expenditure	600	600
6.	Loan taken	-	5,000
	Repayment capacity		

**Repayment capacity** = Gross income – (Working expenses excluding crop loan + family living expenses + Other loan due + Misc. expenditure + crop loan)



**Exercise-19:****Estimation of repayment capacity for partially liquidating loans.**

S.No.	Particulars	Amount (Rs.)	
		Without loan	With loan
1.	Gross returns	38,000	54,000
2.	Working expenses including short term loan	18,600	23,600
3.	Family living expenses	10,000	10,000
4.	Other loan dues	4,000	4,000
5.	Miscellaneous expenditure	600	600
6.	Annual installment due for term loan	-	5617
	Repayment capacity		

**Repayment capacity** = Gross income – (Working expenses including short term loan + family living expenses + Other loan due + Misc. expenditure + annual installment due for term loan)

**Exercise-20:****Estimation of risk bearing ability or repayment capacity under risk**

S.No.	Particulars	Amount (Rs.)	
		Without loan	With loan
1.	Deflated gross returns	28,000	40,800
2.	Working expenses excluding crop loan	8,800	8,800
3.	Family living expenses	10,000	10,000
4.	Others loan due	4,000	4,000
5.	Miscellaneous expenditure	600	600
6.	Loan taken	-	5,000
	Repayment capacity under risk		

**Repayment capacity under risk =**

Deflated gross return – (Working expenses excluding proposed loan + family living expenses + Other loan due + Misc. expenditure + crop loan)

**Deflated gross income =**

Gross income expected – (Gross income X 0.15 (assuming 15 percent variability in gross income)).

#### **4. Loan Repayment Plans:**

The most commonly used repayment plan for repaying the medium and long terms loans are:

**(a.) Straight – end payment plan or single payment plan or lump sum repayment plan-**

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 Ballon repayment plan:**

The farmer is expected to settle the entire loan amount in quarterly, half-yearly or annual installment (Principal + interest). Usually, the installment amount will be decreasing as the years pass by except in maturity year during which the investment generates sufficient revenue for liquidation.

**(c.) Amortised Repayment Plan:**

Amortization means the repayment of the entire loan amount in a series of installments.

**(d.) Amortised Decreasing Repayment Plan:** In this repayment plan, the principal component remains constant over the entire repayment period, while the interest part decreases continuously. The annual installment amount decreases over the years. Example purchase of machinery.

### Exercise-21:

Loan amount : Rs.10,000

Time period : 6 years

Rate of interest: 12%

#### (1.) Amortized decreasing repayment plan:

Year	Principal amount (Rs.)	Interest (Rs.)	Installment (Rs.)	Balance amount (Rs.)
1.	1666.67	1200.00	2866.67	8333.33
2.				
3.				
4.				
5.				
6.				
Total				

#### (2.) Amortized even repayment plan:

This is called equated annual installment method. The annual installment over the entire loan period remains the same in this method. The principal portion of the installment increased continuously, while the interest part declines gradually. This method is mostly adopted for term loan for example digging of wells, construction of godown, dairy shed etc.

The annual installment is arrived at through the formulae given below:

$$I = B \frac{i}{1 - (1 - i)^{-n}}$$

Where,

- I = Annual installment in Rs.
- B = Principal amount borrowed in Rs.
- n = Loan period in years.
- i = Annual interest rate infraction.

**c. Variable Repayment Loan:**

In this plan various levels of installments are paid by the borrower over the loan period. In time of good harvest a higher installment is paid. This method is not found with institutional borrowings.

**d. 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.

**e. 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. Farmers make advance payment of the loan realized from the saving of the previous year. 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.

## **Practical No. - 5**

**Title: Appraisal and Evaluation of Agricultural Project**

**Objective: To know the basic concept of evaluation of Agricultural Projects**

Projects are the cutting edges of development. They are meant for increasing the output from the given resources. Evaluation of projects needs projecting the future trend of output, sales, expected costs, returns, flow of funds etc.

Project is as an investment activity meant for providing the returns for specific clientele group for specific activity, specific objective and specific area development. It should facilitate analysis in planning financing, implementation, monitoring, controlling and evaluation.

### **5.1 Type of Agricultural Projects:**

#### **1. Agricultural Credit Projects:**

These projects provide credit to the farmers for farm investment for increasing agricultural production, raising their standard of living and the economy as whole.

#### **2. Agricultural Development Projects:**

These are the projects aimed at improving farm economy of individuals and regional development.

#### **3. Agro-industries and commercial development projects:**

Projects of supply, services to farming, project concerned with processing, storage, market development, projects for fisheries development etc. are cited under this category.

### **5.2 Phases in project cycle**

1. Conception and identification.
2. Formulation or preparation of the project.
3. Appraisal or analysis.
4. Implementation.
5. Monitoring and evaluation.

### **5.3 Different aspects of projects**

1. Technical aspects

2. Commercial aspects
3. Managerial aspects
4. Organizational aspects
5. Social aspects
6. Economic and financial aspects

#### **5.4 Methodological issues in financial and economic evaluation of agricultural projects**

For appropriate valuation of costs and values of the input and outputs of the project at international exchange rate excluding the effects of domestic tariff, subsidies, excise and other taxes in the economic analysis of the projects.

##### **(a.) Costs aspects**

Annual capital costs of the project at current prices must be ascertained and then they should be weighted by price index in order to get the cost at constant prices. Afterwards the same is multiplied by the construction conversion factor (CCF) to get the economic cost of the project.

- Traded commodities – imported machinery and material – CCF is 1.
- Non-traded commodities – (which require skilled labour) CCF 0.8
- Unskilled labour – CCF is take as 0.75.

##### **(b.) Form level input costs**

Standard conversion factor – (SCF)

$$SCF = \frac{X + M}{X + S_x + M + T_m}$$

Where,

X = F.O.B. (free on board) value of imports at the official exchange rate (OER)

M = C.I.F. (Cost insurance and freight) value of imports at OER

S<sub>x</sub> = Export subsidies

T<sub>m</sub> = Import duties

##### **(c.) Benefit Estimation**

Food grain conversion factor (FCF)

$$= \frac{Q \text{ price} + E \text{ price} + (Q \text{ wheat} - PE \text{ wheat})}{(Q \text{ rice} \times PF \text{ rice}) + (Q \text{ wheat} \times PF \text{ wheat})}$$

Where,

Q = Production in the project region.

PE = Economic price

PF = Financial price

**(d.) Methodology for Social Benefit Cost**

The various parameters involved in the agricultural project are:

(1) Social rate of Discount (SRD)

$$SRD = (1+g)^e - 1 + PTP$$

Where,

g = Growth rate of per capital consumption.

e = Elasticity of diminishing marginal utility of consumption.

PTP = Pure time preference.

**(2) Shadow prices**

SER (Shadow Exchange rate) – (UNIDO, 1978)

$$= \frac{OER (M + Ti) + (X + Sx)}{(M + X)}$$

Where,

OER = Official exchange rate

M = Value of imports

Ti = Import tax revenues

X = F.O.B. value of export

Sx = Export subsidies (-)

**(e.) World Bank formulae**

SCF (Standard conversion factor)

$$= \frac{X + M}{(X + Sx + M + Tm)}$$

Where,

X = F.O.B. values of exports at the OER

M = C.i.f. value of imports at OER

Sx = Export subsidies

Tm = Import subsidies

**(f.) Shadow Price of Investment (Saving)**

$$I = \frac{(1 - a) r}{(i - ar)}$$

Where,

I = Shadow price of investment

i = Social rate of discount

r = Opportunity cost of the capital

a = Rate of investment

**(g.) Shadow Price of Labour**

$$SWR = M + S (I - 1) W \text{ or } SWR/W = M/W + S (I - 1)$$

Where,

SWR = Shadow wage rate

M = Marginal product in present employment

W = The market wage paid to labourer in a new job

S = The rate of saving from profit.

I = The accounting price of investment.

## 5.5 Investment Analysis (Capital Budgeting)

Capital investment made in agricultural projects are made in different time periods and the net are also spread over time. In order to assess the returns from investment, available alternative must be weighted for different lengths of time in respect of costs and returns i.e. recognition of time value of money, profitability and economic variability of capital investment.

### a. Time value of money

#### 1. *Future value of present money -*

Future value of present sum is an important concept in financial analysis and this is called compounding. In this process, the interest is added to the principal at the end of each time period, in turn, earns interest.



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

Where,

A = Future value of the present sum invested in the project.

P = Principal amount invested in the project.

i = Interest rate in percent

t = Number of years

Annuity :

$$A = \frac{P(1 + i)^t - 1}{i}$$

Where,

A = Future value.

P = Annual investment.

t = Time period.

i = Rate of interest

**b. Present value of future money:**

The present value of future sum is the current value of investment to be received in the future.

This present value is worked out through discounting process in which the future sum is discounted back to the present time to find out its current or present value.

$$PW = \frac{P}{(1 + i)^t} \text{ or } P \frac{1}{(1 + i)^t}$$

Where,

PW = Present worth of future money.

P = Money value in future.

i = Interest rate.

t = Project life period in years.

Annuity:

$$PW = \frac{P[1 - (1 + i)^{-t}]}{i}$$

Where,

- PW = Present worth of future money.  
P = Money value in future.  
i = Rate of interest.  
t = Project life period in years.

Broadly there are two methods of project appraisal, viz., undiscounted measures and discounted measures.

## 5.6 Undiscounted Measures:

The undiscounted measures are the naïve methods of choosing among the alternatives projects. The method listed under these measures often mislead in the ranking of the project and hence, choices so wrong.

### (a.) Ranking by inspection:

It is based on the size of costs and length of cash-flow stream. Suppose if the two projects are with the same investment and the same net value of production, but with difference in the length of the period, than the project with larger duration is preferred to the one with shorter period time.

### (b.) Payback period:

Another simple method of ranking a project is the length of time required to get back the investment on the project.

$$P = \frac{I}{E}$$

Where,

- P = Payback period of the project in the years.  
I = Investment of the project in rupees.  
E = Annual net cash revenue in rupees.

**Exercise-22:**

Calculation of payback period

Initial investment Rs.20,000

Years	Cash flow (in Rs.)	
	Project – A	Project – B
0		
1		
2		
3		
4		

**(c.) Proceeds per rupee of outlay:**

This is worked out by dividing the total proceeds with the total amount of investment, and a given project is ranked based on the highest magnitude of the parameter.

**(d.) Average annual proceeds of rupee outlay:**

This is the another simple choice criterion and in this procedure, total receipts are first divided by the project life span and the average proceeds obtained per year are divided by the initial investment on the project. Here ranking is given to the projects, based on the highest magnitude of the estimate.

The major drawback with undiscounted measures is that for the same data of the project, we get different ranking, hence, choice process becomes useless. Ranking by these methods are inconsistent and in compatible.

**5.7 Discounted Measures:**

Cash flow are yearly net benefits accrued from the project. If they are weighted by discount rate, they become discounted cash flows. These discounted cash flows are the best estimates to decide on the worth of the project.

Usually, following discounted measures are applied to evaluate the agricultural projects.

**(a.) Net Present Worth (NPW) or Net Present Value (NPV):**

It represents the present worth of incremental net benefit i.e. the income stream generated by an investment.

$$NPW = \frac{P_1}{(1+i)^{t_1}} + \frac{P_2}{(1+i)^{t_2}} + \dots + \frac{P_n}{(1+i)^{t_n}} - C$$

Where,

- $P_1$  = Net cash flow in first year.
- $i$  = Discount rate.
- $t$  = Time period.
- $C$  = Initial cost of the investment

OR

$$NPW = \sum_{n=1}^t \frac{Bt - Ct}{(1+i)^t}$$

Where,

NPW = Present worth of benefits – Present worth of costs

Bt = Sum of yearwise benefit.

Ct = Sum of the yearwise costs.

$i$  = Discount rate.

$t$  = Time period.

**Note :** Projects with positive NPW are given weightage in the selection compared to those with negative present value, while zero NPW makes the investor indifferent.

**(b.) Benefit-Cost Ratio (B-C Ratio)**

$$\begin{aligned} \text{B-C Ratio} &= \frac{\sum_{t=1}^n \frac{Bt}{(1+i)^t}}{\sum_{t=1}^n \frac{Ct}{(1+i)^t}} \\ &= \frac{\frac{B_1}{(1+i)} + \frac{B_2}{(1+i)^2} + \dots + \frac{B_n}{(1+i)^n}}{C_0 + C_1 + C_2 + \dots + C_n} \end{aligned}$$

$$\frac{\dots\dots\dots}{(1+i)} + \frac{\dots\dots\dots}{(1+i)^2} + \dots\dots\dots + \frac{\dots\dots\dots}{(1+i)^n}$$

Where,

- B<sub>1</sub> = Benefit for first year.
- C<sub>0</sub> = Initial cost.
- C<sub>1</sub> = Cost for first year.
- i = Discount rate.
- n = Time period.

**Note:** The most common procedure of selecting project is, to choose the projects, having B-C ration of more than one, when discounted at opportunity cost of capital, finally, the given project is opted for implementation, among alternatives based on the highest B-C ration.

**(c.) Internal Rate of Return (IRR)**

In the computation of Internal Rate of Return (IRR), the time value of money is accounted. The method of working IRR provides the knowledge of actual rate of return from the different projects. Thus IRR is known as marginal efficiency of capital of yield on the investment. It is the discount rate of which the present values of net cash flows are just equal to zero, i.e. NPW = zero.

$$\text{IRR} = \text{Lower discount rate} + \frac{\text{Difference between the two discount rates}}{\left[ \frac{\text{Present worth of the cash flow at the lower discount rate}}{\text{Absolute difference between the present worth of the cash flow at the two discount rates}} \right]}$$

**Note:** The selection criterion for IRR measure of project worth is to accept all the independent projects with internal rate of return equal to or greater than the opportunity cost of capital.

In the view of Gittinger, appropriate social discount rate is used in the project analysis, which in fact poses a problem. Ranking of acceptable alternative project is not possible with NPW because it is an absolute measure, attractive project will have a small NPW than a large but less acceptable project. B-ratio is mostly used to evaluate social projects but not private projects. In general IRR method is preferred for the following obvious reasons.

1. It is an unambiguous estimate.
2. It is consistent with interaction
3. Its estimate is unique and it accounts for all cash flows associated with the projects and time value of money, and
4. It has got wider applicability.

The only limitation is that a precise IRR is obtained with narrow difference in the two discount rates assured, complications are involved in the computation process.

**(d.) Net Benefit Investment Ratio (N/K)**

Net benefit investment ratio is a reliable measure for ranking independent project i.e. those which are not mutually exclusive.

$$N/K = \frac{\sum_{t=1}^n \frac{N_t}{(1+i)^t}}{\sum_{t=1}^n K_t (1+i)^t}$$

Where,

$N_t$  = Incremental net benefit in each year after stream has turned positive.

$K_t$  = Incremental net benefit in initial years when stream is negative.

$t$  = 1,2.....n

$n$  = No. of years

$i$  = Interest rate

**Note:** All projects with N/K ratio greater than or equal to 1 may be selected.

**Exercise-23: Estimation of NPW, B-C-Ratio and IRR (Sericulture 1 ha.)**

Year	Cost (Rs.)	Returns (Rs.)	Net income (Rs.)	Discount factor		
				12%	15.5%	20%
1.	38900	-		0.8929	0.565	0.83
2.	9239	28475		0.7972	0.749	0.69
3.	10575	32550		0.7118	0.649	0.58
4.	11952	35610		0.6355	0.562	0.48
5.	12858	39802		0.5674	0.486	0.40
Mono Orchard (One ha.) at the end of 6 <sup>th</sup> year						
6.	25000	-		0.507	0.421	0.33
7.	4250	10260		0.452	0.364	0.28
8.	4792	12550		0.404	0.315	0.23
9.	5368	14530		0.361	0.273	0.19
10.	5975	16275		0.322	0.237	0.16
11.	6456	19396		0.287	0.204	0.14

**Exercise-24: With the given information calculate NPW, B-C-Ratio and IRR**

Project period	Cost (Ct)	Benefit (Bt)	Discount factor		
			15.5%	20%	25%
1.	233860	-	0.865	0.83	0.80
2.	36707	110112	0.749	0.69	0.64
3.	36484	109854	0.649	0.58	0.51
4.	40337	92739	0.562	0.48	0.41
5.	33689	78739	0.486	0.40	0.33
6.	36008	88747	0.421	0.33	0.26
7.	29012	64460	0.364	0.28	0.21
8.	28168	58996	0.315	0.23	0.17
9.	23122	66598	0.273	0.19	0.13
10.	30325	59132	0.237	0.16	0.11
11.	20091	150361	0.204	0.14	0.09

**5.8 Sensitivity Analysis**

Project appraisal techniques above, provide us certain measure of projects worth and this is related to a certain period of time and we will be forming this measure of the project under the assumption that the data used in the project evaluation remain unchanged over a length of time. But, in reality this is not a valid assumption because our estimates of costs and

returns go away overtime, as prices of agricultural produce as well as the costs of inputs are subject to change. Under this conditions our estimates of economic analysis will be misleading. The sensitivity analysis of the project appraisal includes the following points.

- (1.) Consideration of the length of the period over the existing one.
- (2.) Charges (increase or decrease) in the price of goods and services by certain proportions of the project say by 10, 20, 30, 40, 50 percent etc.
- (3.) Charge in the levels of say by 10, 20, 30, 40 percent etc.
- (4.) Charges in the yield level of crops and livestock
- (5.) Delay in the implementation i.e. varying gestation periods.

Elaborate risk analysis using probability analysis, swathing value and simulation models employing the randomization are the most appropriate tools to indicate the real worth of the project under the conditions of risk and uncertainty.



## **Practical No. - 6**

**Title: The All India Rural Credit Survey Committee Report**  
**Objective: To know about different recommendation about the credit improvement various committee.**

The All India Rural Credit Survey Committee appointed by RBT in 1951 under the Chairmanship of Shri A.D. Gorwala brought out that the cooperative credit was unevenly distributed, inadequate and mostly lent to the asset oriented large cultivators. The report observed that cooperation has failed in India but must succeed. The committee recommended on integrated scheme as a remedy to existing situation, the salient features of which were –

- (i.) State partnership in cooperative institutions at all levels.
- (ii.) Co-ordination between cooperative credit marketing and processing, and
- (iii.) Training of cooperative personnel at all levels.

Later, the committee on taccavi loans and Co-operative credit under the Chairmanship of Shri B.P. Patel in 1961-62 felt that the cooperatives should provide loans to the farmers for the agricultural operations and land improvements and taccavi loans should be confined to the farmers only under distressed conditions. Regarding the supervision of societies at gross root level, i.e., Primary Co-operative Credit Societies, the committee on Cooperative Administration, under the Chairmanship of Shri V.L. Mehta opined that the District Cooperative Banks should assume this responsibility.

### **6.1 The All India Rural Credit Review Committee**

The All India Rural Credit Review Committee which was constituted in July, 1966 under the Chairmanship of Shri B. Venkatappaiah in its final report submitted in July, 1969, recommended the reorganization of primary societies into viable units, rehabilitation of weak central cooperative banks, greater flexibility in the conservation of short term loans into medium term loans, simplification of application form and disbursal of part of the loan in kind.

### **6.2 Outlines of Recommendations of Khusro Committee and Narasimham Committee**

Two committees viz., Khusro and Narasimham committee examined the formal agricultural credit system in India and recommended certain important changes regarding modifying rural banking structure, interest rate policy and cooperative credit structure. The

Agricultural Credit Review Committee (ACRC) under the Chairmanship of A.M. Khusro was appointed by RBI in August 1986 and it submitted its report in August 1989. Later the committee on financial systems which was appointed by Government of India in August 1991 submitted its report in November 1991.

### **6.3 Khusro Committee Report**

Its recommendations pertained to the cooperative credit system, Regional Rural Banks (RRBs) and commercial banks. It estimated the gross interest margins and suitably recommended lending rates to these institutions. The ceiling for the lending rate for commercial banks towards agricultural lending was fixed at 15.5 percent, whereas in case of Primary Land Development Banks (PLDBs) it was 5 percent and 8.65 percent of RRBs.

The committee recommended that any short fall in the interest earnings may be made good to the credit institutions by the Government. It made two broad recommendations on the structure of agricultural credit institutions in India.

1. It recommended the merger of RRBs into sponsoring commercial banks. This is very essential in the areas where the performance of RRBs is not economically viable.
2. It recommended the creation of National Cooperative Bank to function as National Apex Bank for all cooperative institutions in the country.

### **6.4 Narasimham Committee Report**

The Government of India constituted a 9 member committee under the Chairmanship of Mr. M. Narasimham, Retired RBI Governor on August 14, 1991 for making recommendations on existing financial system and to give suggestions for improving the existing structure. The committee submitted its report to the Finance Minister in November 1991 which was placed on the table of Parliament on December 17, 1991.

The salient recommendations are:

1. 4 tier banking system should be introduced in the country.
  - I. tier 3 or 4 International Banks
  - II. tier 8 or 10 National Banks
  - III. tier Regional Banks
  - IV. tier Rural Banks
    - (i.) Branch Licensing System for opening new bank branches should be abolished.

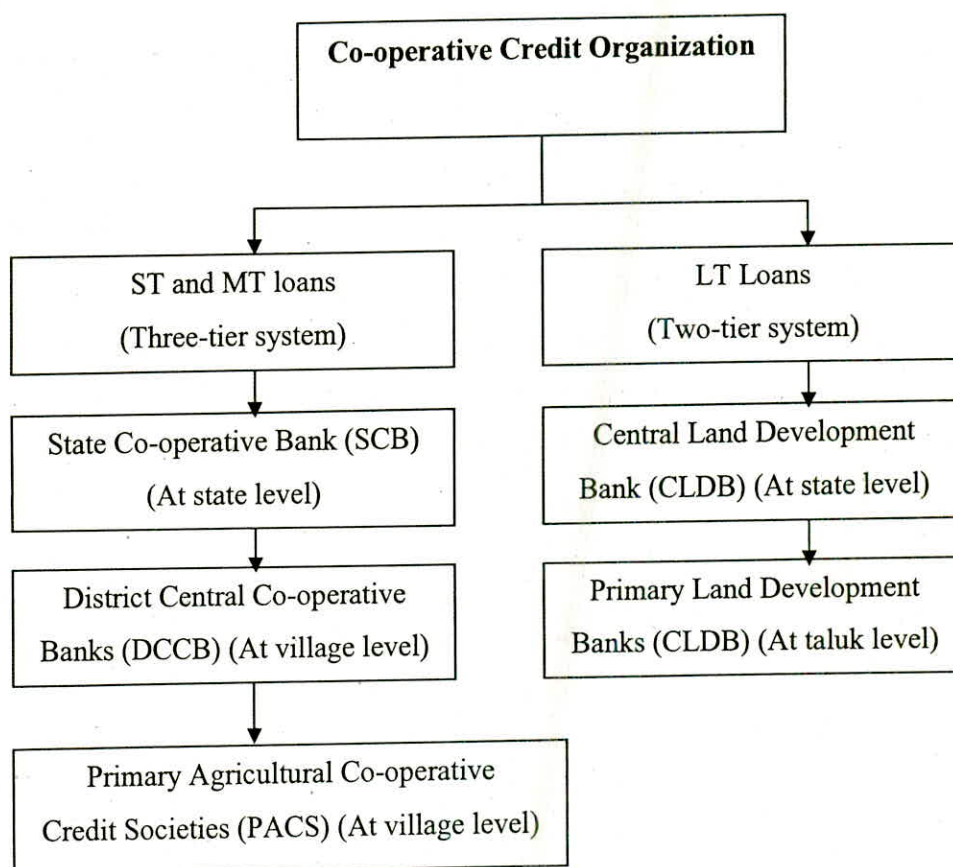
- (j.) A Liberal view should be adopted for allowing foreign banks in the country. Both foreign and domestic banks should be treated at par.
- (k.) SLR for banks should be curtailed to the level of 25% within next 5 years. CRR should also be curtailed in various phases.
- (l.) Banks should be given more autonomy and the directed credit should be abolished.
- (m.) Primary targets for credit should be redefined and such credit should not be more than 10% of total credit.
- (n.) Computerization in banks should be promoted.
- (o.) Banks should be authorized to appoint banking official at their own discretion.
- (p.) The dual control of RBI and Finance Ministry on banks should be abolished and RBI should function only as a regulatory authority of banking system in the economy.
- (q.) RBI's representative should not be included in the management boards of banks. Only Government representative should be there.
- (r.) Granting resources to development finance institutions on concessional rates of interest should be abolished in phases within next 3 years. These institutions should be allowed to mobilize resources from open market on competitive rates.
- (s.) Quick and effective liberal attitude should be adopted in the policy related to capital market system of getting prior permission by the companies for their new share issues should also be abolished.

## Practical No. - 7

**Title: Co-operative Finance**

**Objective: To know the cooperative bank structure in the state**

According to Calvert "Co-operation is a form of organization, wherein persons voluntarily associate together as human beings on the basis of equality for the promotion of common economic interest of themselves". When co-operation is applied to agricultural credit, it has a great significance. If the co-operatives are rightly organized in the sphere of rural credit, they can thwart the domination of money lenders and rescue the farmers from their clutches.



### 7.1 STATE CO-OPERATIVE BANK (SCB)

These are the co-operative credit organizations present at the State capitals. DCCBs and PACS are the members of these banks. These institutions supervise activities of the member banks and mobilize and deploy the financial resources among the member banks. They serve as a link between the RBI and the PACS. The specific functions of the State Co-

operative Banks are: (1) they help the State Governments in formulating development plans with regard to co-operative institutions; (2) they co-ordinate the policies of the co-operatives with the Government; (3) they formulate and implement uniform credit policies regarding co-operative development in the State; (4) they act as banker's bank to DCCBs, supervise, control and guide the activities of DCCBs; (5) they grant subsidies to DCCBs for the smooth functioning of co-operatives; and (6) similar to any commercial bank, they also perform normal banking operations.

## **7.2 DISTRICT CENTRAL CO-OPERATIVE BANKS (DCCBs)**

These banks are, infact the link between State Co-operative Banks 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 taluk to the district, but in most of the States their operations are confined to the taluk 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 banks. The specific functions of the banks are: (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.

## **7.3 PRIMARY AGRICULTURAL CO-OPERATIVE CREDIT SOCIETIES (PACS)**

Consequent to the enactment of Co-operative Societies Act of 1904, PACS came into operation following the guidelines of the Raiffeisen model. The co-operative principles like limited liability, limited area of operation, honorary management, voluntary participation of villagers, etc., were framed for the smooth functioning of the societies. The societies are at the village level and directly meant for the farmers regarding provision of requisite short-term and medium term loans. Supply of agricultural inputs and other essential commodities is also taken up by these societies. In addition to these activities, PACS are also helping in formulating and implementing the agricultural development plants. They are also undertaking advisory and welfare functions for the members. The PACS are associated with the following functions: (1) they borrow adequate and timely funds from DCCBs and help the members in financial matters; (2) they attract local savings in the form of share capital and deposits from the villagers, thereby inculcating the habit of thrift; (3) they supervise the end use of credit; (4) they distribute fertilizers, insecticides, etc., to the needy farmers; (5) they provide

machinery on hire basis to the farmers; (6) they associate with the programmes and plans meant for the socio-economic development of the village; (7) they also involve in the marketing of farm produce on behalf of the farmer-borrowers; (8) they provide storage facilities and marketing finance; and (9) they supply certain consumer goods like rice, wheat, sugar, kerosene, cloth, etc., at fair prices.

#### **7.4 CENTRAL LAND DEVELOPMENT BANK (CLDB)**

As an apex bank in the two-tier co-operative credit structure, it provides long-term finance to PLDBs and also to its affiliated branches working in the States. Branches of CLDBs, PLDBs and individual entrepreneurs are the members of the CLDB. National Bank for Agriculture and Rural Development (NABARD) and Life Insurance Corporation (LIC) subscribe for its debentures in large amounts. Infact, NABARD is the refinancing agency to the CLDB. It acts as a link between NABARD and the Government in the long-term banking transactions. It supervises, inspects and guides the PLDBs in their banking operations. It floats debentures for raising necessary funds. It inculcates the spirit and practice of thrift among the member banks by mobilizing savings and stimulating capital formation. The CLDB generally purveys loans to member banks for the redemption of old debts, improvement, reclamation and developments of land, purchase of agricultural machinery and equipment, and development of minor irrigation.

#### **7.5 PRIMARY LAND DEVELOPMENT BANKS (PLDBs)**

The establishment of Land Mortgage Bank on co-operative lines dates back to the year 1920 in Punjab. Later during the period 1920-29 many Land Mortgage Banks were established in Punjab, Madras, Mysore, Assam and Bengal. There was not much growth in the Land Mortgage Banks till 1945, however, an alround progress of these banks was witnessed during the post-independence period, i.e., 1948-53. During this period, only rich and affluent farmers derived benefit from the LMBs. Small and marginal farmers were hardly benefited. LMBs received massive support from institutional agencies like Reserve Bank of India, State Bank of India, Life Insurance Corporation and Agricultural Refinance Corporation. As a result the LMBs reoriented their lending policies towards small and marginal farmers and much emphasis was given to agricultural development. In the year 1974, LMBs were renamed as LDBs in A.P. Primary LDBs are generally organized to serve the farmers at taluk level. The specific functions are : (1) they provide long term finance to the needy farmers for the development of land, increasing agricultural production and productivity of land; (2) they provide loans for minor irrigation and for redemption of old debts and purchase of land; (3) farmers interested in purchasing tractors, machinery and equipment are financed; (4) the banks also provide finance for construction of farm structure; and (5) they mobilize rural savings.

## Practical No. - 8

**Title: Meaning and principles of Co-operation:**

**Objective: To know about the cooperative**

The theory of co-operation is stated very briefly that an isolated and powerless individual can by association with others and by moral development and mutual support, obtains in his own degree, the material advantages available to wealthy and powerful persons and thereby develop himself to the fullest extent to his natural abilities.

A co-operative society is an association of economically weak persons who voluntarily associating on the basis of equal right and equal responsibility, transfer to an undertaking one or several of the economic function corresponding to one or several of the economic needs which are common to them all but which each of them is unable fully to satisfy by his own individual efforts to manage and use such undertaking in mutual collaboration to their common material and moral advantage.

Co-operation in its technical sense means abandonment of competition in distribution and production and the elimination of middlemen of all kinds.

It is an organization wherein persons voluntarily associate as human beings on the basis of equality for the promotion of the economic interests of themselves.

### 8.1 Basic Principles of Co-operation

- |                          |                            |
|--------------------------|----------------------------|
| (1) Equality             | (2) Economy                |
| (3) Unity                | (4) Voluntary Association  |
| (5) Facility             | (6) Proximity              |
| (7) Open Membership      | (8) Distribution of Profit |
| (9) Loan on Low Interest | (10) Co-operation          |
| (11) Service             | (12) Common Welfare        |

## REFERENCES

Gittinger, J.C. Price (1976) Economic Analysis of Agricultural Projects, A World Bank Publication.

Johl, S.S. and C.V. Moore (2006) Essentials of Farm Financial Management, Tomorrows Printers and Publishers, Anasari Road, Dargaganj, New Delhi.

Kahlon, A.S. and Singh, Karam (1984) Managing Agricultural Finance, Theory and Practice, Allied Publishers, Pvt. Ltd., New Delhi.

Krishnasawami, O.R. (1978) Fundamentals of Cooperation, S.Chand and Company Ltd., New Delhi.

Reddy, S. Subba and P.Raghu Ram (2000) Agricultural Finance and Management, Oxford and IBH Publishing Co. Pvt.Ltd, New Delhi.

Reddy, U.K. (1990) An Introduction to Agricultural Finance, Kalyani Publishers, New Delhi.

Shah, Tushaar (1995) Making Farmer's Cooperative work: Design, Government and Management, Sage Publication, New Delhi.

William, G. Murray and Aaron G.Nelson (1960) Agricultural Finance The Iowa State University Press, Ames, Iowa.



## APPENDIX – I

AAP	-	Annual Action Plan
ACD	-	Agricultural Credit Department
ADB	-	Agricultural Development Branch
AFC	-	Agricultural Finance Cooperation
AIGBWO	-	All India Gramin Bank Workers Organization
AIRCRC	-	All India Rural Credit Review Committee
AIRCSC	-	All India Rural Credit Survey Committee
AIRDISC	-	All India Rural Debt and Investment Survey Committee
BCR	-	Benefit-Cost Ratio
BIRD	-	Banker Institute of Rural Development
BOP	-	Balance of Payment
BLBC	-	Block Level Banker's Committee
BRIMS	-	Block Rural Industries Marketing and Servicing Society
CADA	-	Command Area Development Authority
CALCOB	-	Committee as Agricultural Loans through Commercial Bank
CAS	-	Credit Authorization Bank
CCA	-	Capital Consumption Allowance
CIS	-	Crop Insurance Scheme
CRAFICARD	-	Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development
CRR	-	Cash Reserve Ratio
DBOD	-	Department of Banking Operations and Development
DCC	-	District Consultative Committee
DCCB	-	District Central Cooperative Bank
DCP	-	District Credit Plan
DICGC	-	Deposit Insurance and Credit Guarantee Corporation
DIRS	-	Differential Interest Rate Scheme
DISCOBARD	-	District Cooperative Bank for Agricultural and Rural Development
DPAP	-	Drought Prone Area Programme
DRDA	-	District Rural Development Agency
DTC	-	District Technical Committee
ECGC	-	Export Credit Guarantee Corporation
FSS	-	Farmer's Service Society
HADP	-	Hill Area Development Projects
IBRD	-	International Bank for Reconstruction and Development
IDA	-	International Development Association
IDADA	-	Integrated Dry Land Agricultural Development Agency
IFC	-	International Finance Corporation
IMF	-	International Monetary Fund
IRDP	-	Integrated Rural Development Programme

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