CHAPTER – III

CONCEPTUAL FRAMEWORK

1. **Financial Management**
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CHAPTER - III

CONCEPTUAL FRAMEWORK

1. FINACIAL MANAGEMENT

3.1 Introduction

In modern times, we cannot imagine a world without the use of money. In fact, money is the life-blood of the present day world and all our economic activities are carried out through the use of money. For carrying on business we need resources which are paid in terms of money. Money is used for obtaining physical resources, carrying out productive activities, business operations and to make payment of suppliers of resources. Hence financial management is considered as an organic function of a business and has rightly got importance.

In narrow sense financial management is defined simply as the task of providing funds needed by the business or enterprise on terms that are the most favorable in the light of its objectives. However, this approach does not take into consideration the instruments, institutions and practices through which funds are raised, it also overlooks the legal and accounting relationship between a company and its sources of funds. Financial management is, therefore, certainly broader than procurement of funds and there are other functions and decisions too.

Financial management is that managerial activity which is concerned with the planning and controlling of the firm's financial resources .As a separate activity or discipline, it is of recent origin. It was a branch of economics till 1890. Still today, it has no unique body of knowledge of its own and it draws heavily on economics for its theoretical concepts.

The subject of financial management is of immense interest to the administrators. Practicing managers are interested in this subject because

among the most crucial decisions of the firm are those which relate to finance and an understanding of the theory of financial management provides them with conceptual and analytical insights to make those decision skillfully.

3.2 Definitions

1. **Solomon**

   "Financial management is concerned with the efficient use of an important economic resource, namely capital funds."

2. **Phillippatus**

   "Financial management is concerned with the managerial decisions that result in the acquisition and financing of short term and long term credits for the firm."

3. **S. C. Kuchhal**

   "Financial management deals with procurement of fund their effective utilization in the business."

3.3 Scope of Financial Management

The importance of financial management cannot be over-emphasized. Some people think that financial management is useful only in private enterprise. This thinking is not true. In fact a sound financial management is essential in all types of organizations whether profit making or non-profit making where funds are involved.

Financial management is essential in a centrally planned economy as well as in a capitalist set-up, as it plays a crucial role in making the best use of resources. Commercial history is full of examples where firms have been liquidated not because their technology was obsolete or because their labour was not skilled and motivated but because there was a complete mismanagement of financial affairs. Most of the sick mills

become sick merely because the funds were squandered or mismanaged. Even in the boom period when a company makes high profits, there is a danger of higher liquidation, because of bad financial management.

Financial management essentially optimizes the output from the given input of funds. It attempts to use the funds in the most productive manner. In a country like ours where resources are scare and the demand of funds are many, the need for proper financial management is enormous. If proper financial management techniques are used, most of our enterprises can reduce their capital employed and improve the return on investment. It clearly shows that just as men and machines are to be managed properly in the similar manner finances are also to be well managed.

Often, in newly started companies with a high growth rate, adequate attention is not paid to proper financial management on the ground that they want to develop their production and marketing facilities first. However, such companies ignore finance only at their own peril. Actually in the case of such companies, it is even more important to have sound financial management since finance alone guarantees their survival.

Financial management is very important in the case of non-profit organization also. Such organizations pay heavy interest charges and borrowed funds, yet they are tardy in realizing their own debtors. All these arise because one has no realization of the concept of time value of money. It is not appreciated that each rupees has to be made use of and it has a direct cost of utilization. It has to be realized that keeping rupees idle even for a day results in ton losses. A non-profit organization may not be keen to make profit, in the traditional sense of the term but surely it needs to cut down its cost and use the funds at its disposal to their optimum capacity. A sound sense of financial management has to be

cultivated among our bureaucrats, administration, engineers, educationists and public at large. Unless this is done the wastage of the scare capital resources of our country cannot be stopped.

3.4 Objectives of Financial Management

Effective financial management requires the existence of some objectives or goals because judgments as to whether or not a financial decision is efficient must be made in the light of some objectives. Although various objectives are possible we assume two objectives of financial management. That are.

Profit Maximization

It has traditionally been argued that the objective of a company is to earn profit; hence the objective of financial management is also profit maximization. This implies that the finance manager has to make his decisions in a manner so that the profits of the concern are maximized. Each alternative, therefore, is to be viewed from its profit making capacity.

However, profit maximization cannot be the sole objective of a company. If profit is given undue importance then a number of problems can arise. Some of these have been discussed below.

1. The term profit is vague. It does not clarify what exactly it means. It conveys a different meaning to different people. For example, profit may be in short term or long term period; it may be total profit or rate of profit etc.
2. Profit maximization has to be attempted with a realization of risks involved. There is a direct relationship between risk and profit. Many risky prepositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximization is the only goal, then risk factor is altogether ignored. This implies that finance

manager will accept highly risky proposal also, if they give high profits. In practice, however risk is very important consideration and has to be balanced with the profit objective.

3. Profit maximization as an objective does not take in to account the time pattern of returns proposals. A may give a higher amount of profit has compared to proposals B, yet if the returns begin to flow say 10 years later, proposal may be preferred which may have lower overall; profits but the returns flow is more early and quick.
4. Profit Maximization as an objective is too narrow. It fails to take in to account the social considerations as also the obligations to various interests of workers, consumers, society as well as ethical trade practices. If these factors are ignored, a company cannot servings for long. Profit maximization at the cost of social and moral obligations is a short sighted policy.

Wealth Maximization

Some thinkers feel that the real objective of firm is wealth maximization. The readers would appreciate that a company which has profit maximization as its objective may adopt policies yielding exorbitant profit in the short run wealth maximization, is essential for the growth survival and overall interest of the business. A company may not undertake planned and prescribed shot-downs of the plant for maintenance etc. for simply reduces the life of a plant say by five years, the company is ignoring maintenance only at its own peril although it may have greater profit in the short run. Hence it is commonly agreed that the objective of a firm should be to maximize its value or wealth. How do we measure the value wealth of a firm? According to Van Horne, "Value of a firm is represented by the market price of the company common stock.

The market price of a firm's stock represents the focal judgment of all market participants as to what the value of the particular firm is, like takes in to account present and prospective future earnings per share, the timing and risk of these earnings, the dividend policy of the firm any many other factors that bear upon the market price of the stock. The market price serves as performance index or report card of the firm's progress. It indicates how management is doing on behalf of stock holders. "

3.5 Role and Functions of Financial Management

Financial Management plays two basic roles are namely,

1. To participate in the process of putting funds to work with in the business and to control their productivity.
2. To identify the need for funds and select the sources from which they may be obtained.

The functions of financial management may be classified on the basis of

A. Liquidity

B. Profitability

A. Liquidity

Liquidity is ascertained on the basis of three important considerations.

1. Forecasting cash flow, that is matching the cash inflows against the cash outflows;
2. Raising funds that is financial manager will have to ascertain the sources from which funds may be raised and the time when these funds are needed.
3. Managing the flow of internal funds, that is keeping its accounts, with a number of banks to ensure a high degree of liquidity with minimum external borrowing.

B. Profitability

While ascertaining profitability following factors are taken in to account.

1. **Cost Control**

   Expenditure in the different operational areas of an enterprise can be analyzed with the help of an appropriate cost accounting system to enable the financial managers to bring cost under control.

2. **Pricing**

   Financial manager provides tools of analysis of information in pricing decisions and contributes to the formulation of pricing policies jointly with the marketing manager.

3.6 Functions of Financial Executives

To achieve the objective of the financial management i.e. to maximize the owner's wealth, the financial executives have to perform variety of task to discharge their responsibilities. With the evolution of finance from being mere a descriptive study to the one that is highly developed discipline, the role of financial manager has also undergone a sea change. Its area of responsibilities is now extend for beyond keeping records, reports, the firm cash position, paying bills and obtaining funds, and he is now concerned with and is fully involved in the decision making processes to decide investments of funds in assets determining the best mix financing and dividend in relation to overall valuation of the firm. The responsibility of the financial manager are linked to the goal of ensuring liquidity, profitability or both and is also related to the management of the assets and funds of any business enterprise. In the light of different responsibilities of the financial manager, he performs mainly the following duties.

1. Forecasting of Cash Flow

This is necessary for the successful day to day operations of the business so that it can discharge its obligations as and when they arise in fact it involve matching of cash inflow against outflows and manager must forecast the sources and the timing and inflow from customers and use then to pay liability.

2. Raising Fund

The financial manger has to plan for mobilizing fund from different sources so that the requisite amount of fund are made available to the business enterprise to meet it is requirements for short term medium term and long term.

3. Managing the Flow of Internal Funds

The manger has to keep a track of the surplus in various bank accounts of the organization and ensure that they are properly utilized to meet requirements of the business. This will ensure that liquidity position of the company is maintained intact with minimum amount of external borrowings.

4. To Facilitate Cost Control

The financial manager is generally the first person to recognize when the cost for the supplies or production process exceeding the standard cost. Consequently, he can make recommendations to top management for controlling the cost.

5. To Facilitate Pricing of Product and Services

The financial manager can supply important information about cost changes and cost at varying level of production and profit margin needed to carry on the business successfully. In fact financial manager uses various tools of analyses of pricing decision and contributes to the formulation of pricing policies jointly with marketing manager.

6. Forecasting Profit

The financial manager is usually responsible for collecting the relevant data to make forecast of profit level in future.

7. Measuring Required Return

The acceptance of rejection of an investment proposal depend on whether the expected return .From the proposed investment is equal to or more than the required return, An investment project is accepted if the excepted return is equal or more then the required return. Determination of the required rate of return is the responsibility of the financial manager and is a part of the financial decision.

8. **Managing Assets**

The function of asset management focuses on the decision making role of financial manger. Finance personnel meet with other officers of the firm and participate in making decisions affecting the current and future utilization of the firm resources. As an example manager may discuss the total amount of asset needed of by the firm to carry out its operations. They will determine the composition or mix of asset that will help the firm best achievement of its goals. They will identify ways to use existing assets more effectively and reduce waste and unwarranted expenses.

9. Managing Funds

Funds may be viewed as the liquid asset of the firm in the management of funds. The financial manager act as specified staff officers to the chief executive of the company. The manager is responsible for having sufficient fund for the firm to conduct its business and to pay its bills. Money must be located to finance receivable the inventories to make arrangement for the purchase of the asset and to identify the sources of long term financing. Cash must be available to pay dividends declared by the board of directors.

3.7 Agricultural Finance

Finance in agriculture is as important as development of technology. Technical inputs can be purchased and used by a farmer only on the basis of money. But his own money is always inadequate and he needs outside finance or credit.

Professional money lenders were the only source of credit to agriculture till 1935. They used to charge unduly high rates of interest and follow serious mal-practices while giving loans and recovering them. As a result, farmers were heavily burdened with debts and many of them into perpetuated debts. There were widespread discontents among farmers against these practices and there were instances of riots also. With the passing of Reserve Bank of India Act, 1934.District Central Co-op. Banks Act and Land Development Banks Act.etc agricultural credit received impetus and there were improvements in agricultural credit. A powerful alternative agency came into being. Large-scale credit became available with reasonable rates of interest on easy terms, both in terms of granting loans and recovery of them. Although the co-operative banks started financing agriculture with their establishments in 1930's, real impetus was received only after Independence when suitable legislation were passed and policies were formulated. Thereafter, bank credit to agriculture made phenomenal progress by opening branches in rural areas and attracting deposits.

Till 14 major commercial banks were nationalized in 1969, co-operative banks were the main institutional agencies providing finance to agriculture. After nationalization, it was made mandatory for these banks to provide finance to agriculture as a priority sector. These banks undertook special programs of branch expansion and created a network of banking services throughout the country and started financing agriculture on large scale. Thus, agriculture credit acquired multi-agency dimension.

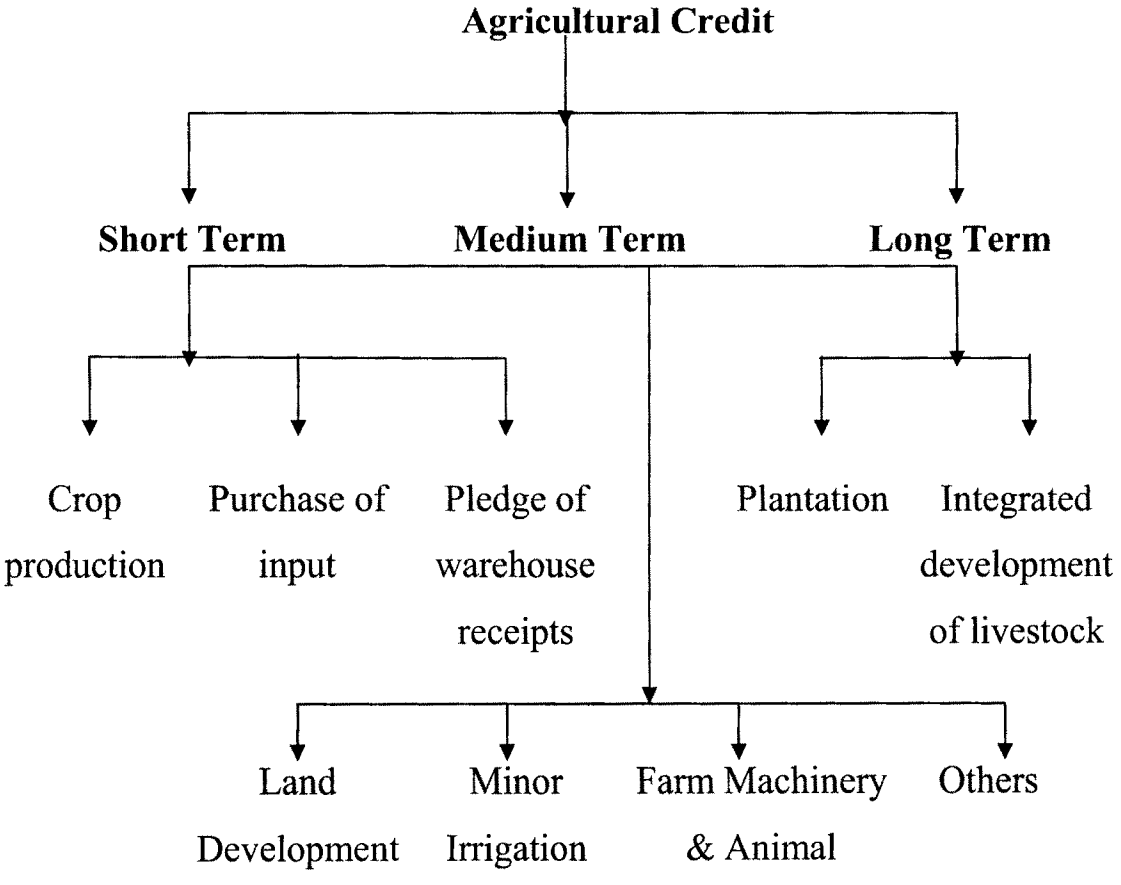
Development and adoption of new technologies and availability of finance go hand in hand. In bringing "Green Revolution", "White Revolution" and now "Yellow Revolution" finance has played a crucial role. Now the agriculture credit, through multi agency approach has come to stay.

The procedures and amount of loans for various purposes have been standardized. Among the various purposes "Crop loans" (Short-term loan) has the major share. In addition, farmers get loans for purchase of electric motor with pump, tractor and other machinery, digging wells or boring wells, installation of pipe lines, drip irrigation, planting fruit orchards, purchase of dairy animals and feeds/fodder for them, poultry, sheep/goat keeping and for many other allied enterprises.

3.8 Need of Finance

Like any productive activity agricultural needs financing for its various production process, purchase of inputs, sale of output, improvement in land development of agricultural etc. These needs are there even in the case of agricultural run on traditional lines. But these are much more in relation to agriculture which is in the process of modernization.

3.9 Structure of Agricultural Credit in India



3.10 Needs of Finance

1. Agricultural Operation

Funds are required for agricultural operations right from purchase of inputs, tilling of land, seeds, fertilizers, pesticides, equipments, watering, harvesting etc.

2. Unproductive Needs

The poor economic conditions compel smalls and marginal farmers to take loans business needs of agricultural finance should include consumption needs, there are certain type of consumption which ought to be put into the category of marriages, functions from birth to death, purchase of jewellery, litigation, these are unproductive loans creating no income generation.

3. Unusual Needs

It is arising out of unusual events such as crop-failures which reduce the income of farmers well below the average.

4. Repayment of Old Loans

Credit is required for repayments of old, heavy interest burdens loans.

5. Long term Assets

Funds are required to purchase long term assets. Like tractors, construction of wells, animals, farm machinery and equipments, installation of sprinklers, irrigation schemes, warehouses etc.

3.11 Period of Loans

1. Short Period Loans

Short period loans consist of those which are taken for short periods. These range from 1 month to 1 year. Most of the purposes for which these loans are sought are: seed, feed, fertilizers, operating expenses, etc. These are such uses of credit which can be repaid after the harvest or at any rate with in a year.

2. Medium Term Loans

These loans are for a period extending from 1 year up to 5 years. The purpose of the loan for raising crops, purchase of dairy cattle, buying of machinery equipment of tractor, finance for storage of commodities, etc.

3. Long Term Loans

Loans so labelled are meant to be repaid over a period longer than 5 years. The amount involved in this category are often much bigger than in the case of inter mediate loans, and contribute the general of agricultural incomes for a much longer period. The period of loan may be 10, 20 or even more years. These loans are required for purchase of farm

or buying of additional land financing of building relating to farm operations like storage.

It is obvious that credit is of paramount significance for agriculture. It is needed not merely for oiling the ordinary agricultural operations. But more importantly it is required to impart an element of dynamism or growth oriented change in the traditional agriculture.

3.12 Sources of Agricultural Credit in India

The various sources of agricultural credit available to farming commodity in India are as follows.

1. Co-operative Credit

There are two types of institutions in this field. One is the primary agricultural credit societies which cater to needs of short term and medium-term finance. The second is land development banks which provide loans for long term purposes. Co-operative credit is considered the most appropriate institutional arrangement for the finance of agriculture. Being based in rural areas with membership drawn from rural people, these institutions have an intimate knowledge of villages with whom they have to deal. These institutions with rural origin and rural contents are in tune with the rural ethos. Rightly, these institutions are given considerable help by the government. They have also been receiving special treatment and guidance form the Reserve Bank of India. The National Bank of Agricultural and Rural Development renders specialized help and guidance.

2. Commercial Bank Credit

The commercial banks have entered this field recently, and increased the credit supply since the nationalization of big banks in 1969. At present nationalized banks presence in the rural areas is quite significant in terms of their branches, the rural accounts, the rural deposit

and the rural advances. The commercial banking services are meant for specified weaker classes, namely the small/marginal farmers, artisans, etc. in the rural areas.

3. Government Loans

The government help is extended directly and indirectly. Directly the help takes the form of loans to farmers, known as taccavi loans which are given long term loans which low rate of interest and their repayment conditions are easy. Indirectly the government help is provided through co-operative societies. The government help these societies in the initial stage to stand on their own feet by purchasing their share which are later taken over by the Reserve Bank

4. Money Lenders

Of the private source of agricultural finance the most important source is the Mahajan or the money lender. Today also its share of the total rural credit is as much as half (49.2%). Because the slow growth of institutional finance and functioning style of the money lender they are very close to the rural people. They give loans for asking and for varied purposes, including unproductive uses and at any time of the day and with the least formalities. Of course, the interest rates are very high. Produce of the agriculturists and land remain mortgaged.

5. Other Private Sources

Besides moneylenders other non-institutional sources for agricultural credit are relatives, traders, commission, land-lords and others, for long these sources too have been important, with above one third (32.1%) share in the total credit in the early but now- a- day's their contributions are on the decline.

As per the policy of Reserve Bank of India the commercial banks are required to give 40% of their credit to the priority sector. This mainly

includes agriculture. The government also introduces the policy of waiver of agriculture loan with interest to small and medium farmers.

3.13 NABARD

Agricultural happens to be the mainstay of the Indian economy. The Reserve Bank of India, ever since its inception, was entrusted the responsibility of expanding and co-coordinating the credit facilities available to the agricultural sector. National bank has taken over all the functions that the Reserve bank of India performed in the field of rural credit. NABARD is now the apex bank for rural credit.

Functions

1. NABARD functions as an apex institution for the entire rural credit system of the country.
2. As an apex institution, it endeavors to improve the credit distribution system by institution building, restructuring of credit institutions, training of bank personal etc.
3. It co-ordinates the activities of all agencies engaged in the field of rural financing and ensure that they work in perfect harmony.
4. It maintains a Research and Development Fund for promotion of research in agriculture and rural developments.
5. For the promotion of rural development, it formulates projects and programmes in accordance to the needs of different area.
6. It undertakes the work of monitoring and evaluation of projects refinanced by it.
7. It has the responsibility to inspect and supervise the Regional Rural Banks and the co-operative banks.
8. NABARD provides short-term, medium-term and long-term credit to the State co-operative banks.

3.14 Crop Insurance

Crop insurance is purchased by agricultural producers, including farmers, ranchers, and others to protect themselves against either the loss of their crops due to natural disasters such as hail, drought, and floods or the loss of revenue due to declines in the prices of agricultural commodities. The two general categories of crop insurance are called crop-yield insurance and crop-revenue insurance.

Crop-yield insurance: There are two main classes of crop-yield insurance:

Crop-hail insurance is generally available from private insurers (In countries with private sectors) because hail is a narrow peril that occurs in a limited place and its accumulated losses tend not to overwhelm the capital reserves of private insurers. The earliest crop-hail programs were begun by farmers cooperatives in France and Germany in the 1820s.

Multi-peril crop insurance (MPCI): covers the broad perils of drought, flood, insects, disease, etc., which may affect many insureds at the same time and present the insurer with excessive losses. To make this class of insurance, the perils are often bundled together in a single policy, called a multi-peril crop insurance (MPCI) policy. MPCI coverage is usually offered by a government insurer and premiums are usually partially subsidized by the government. The earliest MPCI program was first implemented by the Federal Crop Insurance Corporation (FCIC), an agency of the U.S. Department of Agriculture, in 1938. The FCIC program has been managed by the Risk Management Agency (RMA), also a U.S. Department of Agriculture agency, since 1996.

Crop-revenue insurance: is a combination of crop-yield insurance and price insurance. For example, RMA establishes crop-revenue insurance guarantees on corn by multiplying each farmer's corn-yield

guarantee, which is based on the farmer's own production history, times the harvest-time futures price discovered at a commodity exchange before the policy is sold and the crop planted. There is a single guarantee for a certain number of dollars. The policy pays an indemnity if the combination of the actual yield and the cash settlement price in the futures market is less than the guarantee. In the United States, the program is called Crop Revenue Coverage. Crop-revenue insurance covers the decline in price that occurs during the crop's growing season. It does not cover declines that may occur from one growing season to another.

2. AGRICULTURAL THEORY

3.2.1 Introduction

Agriculture is the mainstay of Indian economy. More than 70% of population is engaged in agriculture sector. India has vast resources of land, manpower and other required sources. Agriculture and related fields include farming, dairy and poultry science, horticulture, raising livestock and agro based industries. Due to improvement in technology, agricultural industries are expanding and are expected to provide better option. Agricultural sector occupies a strategic position in India. It contributes directly towards the economic growth of the country. It plays an important role in industrial development by providing the necessary raw material and market for industrial products. Thus, agricultural development has a significant impact on the overall economic development of the country. Obviously it is also one of the most important instruments to achieve a break through in the rural setting as it exerts an important influence on the socio-economic life of the people.

3.2.2 What is Agriculture?

Agriculture is the science, art and industry of managing the growth of plants and animals for use by humans. In general, agriculture includes soil cultivation, growing and harvesting crops, rising and breeding livestock, dairy, forestry crop farming, animal husbandry, dairy farming, forestry, poultry farming, soil management etc.

3.2.3 Traditional Agriculture

One of the salient features of traditional farming systems throughout the developing world is their high degree of biodiversity. These traditional farming systems have emerged over centuries of cultural and biological evolution and represent accumulated experiences

of indigenous farmers interacting with the environment without access to external inputs, capital, or modern scientific knowledge (Chang, 1977; Grigg, 1974). Using inventive self-reliance, experiential knowledge, and locally available resources, traditional farmers have often developed farming systems with sustained yields (Harwood, 1979). Just in Latin America alone, more than two and a half million hectares under traditional agriculture in the form of raised fields, polycultures, agroforestry systems, etc. document a successful adaptation to difficult environments by indigenous farmers (Altieri, 1991). Many of these traditional agroecosystems, still found throughout the Andes, Meso America and the lowland tropics, constitute major in-situ repositories of both crop and wild plant germplasm. From an agroecological perspective, these agroecosystems can be seen as a continuum of integrated farming units and natural or semi-natural ecosystems where plant gathering and crop production are actively pursued. Plant resources are directly dependent upon management by human groups; thus, they have evolved in part under the influence of farming practices shaped by particular cultures and the forms of sophisticated knowledge they represent (Nabhan, 1983).

Perhaps the greatest challenge to understanding how traditional farmers maintain, preserve and manage biodiversity is to recognize the complexity of their production systems. Today, it is widely accepted that indigenous knowledge is a powerful resource in its own right and complementary to knowledge available from western scientific sources. Therefore, in studying such systems, it is not possible to separate the study of agricultural biodiversity from the study of the culture that nurtures it.

This chapter explains the features of biodiversity inherent to traditional agro eco systems, and the ways in which peasants apply local

knowledge to manage such biodiversity to satisfy subsistence needs and to obtain ecological services. Traditional agriculture is rapidly disappearing in the face of major social, political, and economic changes; therefore, a case is made herein for the preservation of these traditional agro eco systems in conjunction with the maintenance of the culture of the local people. The conservation and management of agro bio diversity is not possible without the preservation of cultural diversity.

Traditional Agriculture comprises of families with older couples and children living on farms. Although over-represented in having children aged from 5 to 14, the most common family structure in Traditional Agriculture is for married couples without children. Many households provide accommodation for farm laborers and seasonal workers. Although mid-range household incomes are common, Traditional Agriculture are also likely to report a nil or negative income, and females are likely to perform domestic duties at home.

Typically, they do not have high levels of education, however many have gained certificates and diplomas in agricultural related areas or in health and education, and few have attended university.

Traditional Agriculture includes the property owners along with farm workers and laborers. The owners classify themselves as managers or small business owners. They have business and public liability insurance to cover their large investments and valuable assets, and self-managed superannuation is common. Traditional Agriculture has an extremely low credit profile, both in demand and risk.

Households in this segment tend to have many cars, with three or more being common. Some have quite substantial savings and investments; these are probably the long-term owners of farms and ranches.

While they find it difficult to get to many forms of entertainment,

Traditional Agriculture enjoy going to the racetrack and betting through bookmakers. Other pastimes include gardening and dressmaking. They prefer traditional meals at home as opposed to going out to restaurants. They are generally light spenders however have high grocery bills.

People found living in this segment are generally not fashion conscious. Although largely limited to dial-up Internet, they do like to get onto the Internet a few times every month, where they often check weather conditions. They prefer to read regional newspapers and tabloids, and magazines about gardening and country lifestyle, as well as magazines such as that's Life.

They tend to watch television programs targeted to country viewers, such as Landline, as well as shows about gardening, current affairs and mysteries. When listening to the radio, they tend to listen to ABC Radio National. These households will generally read addressed mail from retailers and political parties, in the form of a magazine and catalogue.

3.2.4 Modern Agricultural

Engineering and technology is heavily utilized in modern agriculture. Biological and physical sciences are also advancing agricultural production. Fields requiring specialized understanding of agricultural engineering includes irrigation, drainage, conservation, sanitary engineering, genetics etc.

Plant genetics and breeding offers nice benefits to farm productivity. Genetics has also turned livestock breeding into a science.

3.2.5 Mechanization and Innovation

In India agriculture is such a occupation where traditional implements are mainly used at a large scale. However after independence

especially due to, "Green Revolution", a considerable land is brought under HYV crops and cash crops. This had led to the introduction of new machinery to grow crops. The varieties of machines are used for ploughing, sowing weeding, watering the fields, threshing and so on. Use of such new implements leads to higher production of agricultural produce.

3.2.6 Agricultural Chemistry

Agricultural chemistry is associated with other important farming concerns like fertilizer application, insecticides or pest control, fungicides, soil composition, agricultural products analysis, and nutritional requirements of farm animals.

3.2.7 Packaging, Processing & Marketing

Science has also revolutionized the way of packing, processing and marketing agricultural products. For example, dehydration and quick-freezing have increased farm product markets (Food Processing, Preservation, and Meat Packing).

3.2.8Technology

Agriculture used to be a laborious task and still. However, late 19^{th} and 20^{th} century technological advancement has simplified much of the backbreaking toil of farming. Moreover, mechanization has greatly increased the efficiency and productivity of farming.

3.2.9 Aerial Application

In the U.S. airplanes and helicopters are generally used in agriculture for seeding and spraying applications for insect and disease control, transporting perishable goods, and for controlling forest fires.

3.2.10 Communication

Television and radio have played a vital role in agriculture by making available important weather reports and market reports both of are concerns for most farmers.

3.2.11 Nature of Work

Agriculture is an extensive field and it encompasses a number of work options available. A person willing to make career in agriculture field can choose to work in one of the following fields. It includes activities related to banking and credit land appraisal, grading, packaging, marketing and sales, storage and warehousing Agro industry, includes areas related to machinery and equipments, fertilizers, food processing, pesticides and other such industries as Agricultural Education, Banking, Farming Agricultural, Engineering Agriculture Management etc.

3.2.12 Personal Attributes

Agriculturists work in different fields; hence the traits required differ from service to service. However basic traits required are hardworking, sense of responsibility and deep interest and commitment to work for the development of the sector.

3.2.13 Utility of Rice

Rice is a grain belonging to the grass family. It is related to other grass plants such as wheat, oats and barley which produce grain for food and are known as cereals. Rice refers to two species (*Oryza sativa* and *Oryza glaberrima*) of grass, native to tropical and subtropical southeastern Asia and to Africa, which together provide more than one-fifth of the calories consumed by humans. The plant, which needs both warmth and moisture to grow, measures 2-6 feet tall and has long, flat, pointy leaves and stalk-bearing flowers which produce the grain known

as rice. Rice is rich in genetic diversity, with thousands of varieties grown throughout the world.

Throughout history rice has been one of man's most important foods. Today, this unique grain helps to sustain two-thirds of the world's population. It is life for thousands and millions of people. It is deeply embedded in the cultural heritage of their societies. About four-fifths of the world's rice is produced by small farmers and is consumed locally. Rice cultivation is the principal activity and source of income for about 100 million households in Asia and Africa

3.2.14 Origin and History of Rice in India

India is an important center of rice cultivation. The rice harvesting area in India is the world's largest. The two major rice varieties grown worldwide today are Oryza sativa india and *Oryza sativa japonica.* According to research studies, they owe their origin to two independent events of domestication thousands of years ago.

Historians believe that while the Indian variety of rice was first domesticated in the area covering the foothills of the Eastern Himalayas (i.e. north-eastern India), stretching through Burma, Thailand, Laos, Vietnam and Southern China. The japonica variety was domesticated from wild rice in Southern-China which was introduced to India before the time of the Greeks. Chinese records of rice cultivation go back 4000 years.

The earliest remains of cultivated rice in the sub-continent have been found in the north and west and date froms around 2000 BC. Perennial wild rices still grow in Assam and Nepal. It seems to have appeared around 1400 BC in southern India after its domestication in the northern plains. It then spread to all the fertile alluvial plains watered by rivers. Cultivation and cooking methods are thought to have spread to the

west rapidly and by medieval times, southern Europe saw the introduction of rice as a hearty grain. Some say that the word rice is derived from the Tamil word 'arisi.'

Rice is first mentioned in the Yajur Veda (1500-800 BC) and then is frequently referred to in Sanskrit texts. In India there is a saying that grains of rice should be like two brothers, close but not stuck together. Rice is often directly associated with prosperity and fertility; hence there is the custom of throwing rice at newlyweds. In India, rice is always the first food offered to the babies when they start eating solids or to husband by his new bride, to ensure they will have children.

3.2.15 History of Rice Cultivation

There are many unproven mythological tales related to origin of rice, though historians hold little or no stock in any. Rice cultivation is considered to have begun simultaneously in many countries over 6500 years ago. Rice has been cultivated in China since ancient times. Chinese records of rice cultivation go back 4000 years. Most believe the roots of rice come from 3000 BC India, where natives discovered the plant growing in the wild and began to experiment with it. Cultivation and cooking methods are thought to have spread to the west rapidly and by medieval times, southern Europe saw the introduction of rice as a hearty grain. In several Asian languages the words for rice and food are identical.

African rice has been cultivated for 3500 years. In the Middle East and Mediterranean Europe, it started around 800 BC. Rice spread throughout Italy and then France, after the middle of the 15th century, later propagating to all the continents during the great age of European exploration. In 1694, rice arrived in South Carolina, probably originating from Madagascar. The Spanish brought rice to South America at the

beginning of the 18th century. Rice cultivation has been carried into all regions having the necessary warmth and abundant moisture favorable to its growth, mainly subtropical rather than hot or cold.

3.2.16 Bhat

Bhat (rice) is the staple food crop of the district, especially of talukas in the western zone, though it is also grown in other talukas. It occupied about 40 per cent, of the area under cereal crops in the district in 1955-56. The six talukas Shahuwadi, Karvir, Radhanagari, Panhala, Bhudargad and Kagal occupied, amongst themselves, more than 70 per cent, of the area under rice.

Rice is sown in June and harvested from about the middle of September onwards depending upon weather. The variety is mid late or late one. Its average yield per acre is about 1,500 lbs. Several varieties of rice are grown in Kolhapur district. The black (kala) *jirga* rice of Ajara is a well known scented variety. Besides this, there are other good varieties of *sakharsal* and *kolamba* which are generally grown in good soils and known for good yield per acre. There are other inferior varieties too, namely *aviste, havale-mothe, patni, kala-patani, kala-mohan, masad, dodgka, tamsal, mothe-pandhare* and *take.* In the talukas other than those of Shahuwadi, Karvir, Radhanagari and Panhala, paddy seed is sown by a six coultered drill with a distance of six inches in between. The land is ploughed twice, harrowed and manured, if possible, by farm yard manure. This is done in March-April. By May the land is well packed by working with a *phali.* After getting sufficient rain for sowing, the paddy seed is sown direct by the seed drill and covered by a wooden harrow. The seed is, at times, sown in the third week of May in anticipation of rains in the dry lands. The process is known as *dhul-waf-pera.* An improved method of sowing known as the dibbling method is now in practice in these lands.

Instead sowing by drill after preparing the land, the fields are marked by a marker (*yadtang* or *tikatane*) between two lines vertical and horizontal, with a distance of about 10" in between. At each cross, about 5 to 6 seeds of paddy are sown by making a hole and covering it. This method, though it requires more labour for dibbling, saves seed as well as labour on the subsequent operations and gives better yield than drilled paddy.

The system of transplanting is followed only in western and heavy rainfall areas, namely, western parts of Shahuwadi, Panhala, Bavada, Radhanagari, Bhudargad and Ajra talukas. In March-April a plot is chosen for the seed-beds, preferably on higher ground in the field itself. On the seed-beds are spread layers (called *rab*) of dry leaves from forests and grass which are burnt. The seed is then broadcast on the ashes and covered by the soil. This is done after a fair shower of monsoon, generally in the month of June. In July, the seedlings are ready for transplanting when they are five weeks old and grow six inches in height. They are taken from the seed bed, tied in bundles and. after washing them in running water, taken to fields for being planted by hand.

The method of transplanting is expensive and laborious. Rice fields, called *waffas,* are generally formed by embanking all the four sides by earthern bunds to hold sufficient water for transplanting and for growth of the crop. The supply of water is controlled by these bunds. The best rice soil is the one which retains moisture for a longer time with fair clay structure. The yield of rice depends upon constant supply of fresh water and of manures at the proper time. After transplanting is over, water is kept standing in the field upto a certain level till the crop ripens. The crop is ready for harvest from the middle of October onwards. The crop is cut by sickle (*khurpa*) and the stalks, with earheads, are stacked near the threshing floor.

In this region is used for green manuring in certain parts before

transplanting in this way. The sann-seed is broadcast after the first monsoon shower and the land is ploughed. After about a month, when the land is being prepared, the sann-crop is buried underground. The sann-crop at this stage being very tender gets decomposed in about a week's time after it is buried. The land is puddled and only then transplanting of seedlings is completed.

Recently, some improved varieties (early, midlate and late ones) of rice have been introduced in the district. They are Patni No. 6, D-6-2-2, Panvel-61, Antarsal-90, Antarsal-67, Mugad 81, Mugad 161, Warangal-487 and Yelikirisal-4.

Recently, Japanese method of paddy cultivation has attracted attention of the farmers as a result of the propaganda carried on by the Department of Agriculture to popularise this method in Maharashtra State. Kolhapur District, being a major paddy producing area, has been considered suitable for the introduction of this method. Farm demonstrations and publicity programmes (posters, films, brochures, etc.) are organised to popularise it. Results of the demonstration plots have shown that, on an average, the cost of cultivation by Japanese Method comes to Rs. 230 per acre as against Rs. 150 by the, local method while the average yield per acre under these two methods is about 30 maunds and 15 to 20 maunds respectively. In Kolhapur district more than 11,000 acres (till middle of 1957) of land have been brought under this method of cultivation.

The main features of this method are

1. Raised nurseries for seedlings;
2. Availability of rate at low from nurseries;
3. Heavy manuring of the crop both in nurseries and in the field;
4. Transplantation of fewer seedlings per bunch;
5. Transplanting in rows; and

6. Adequate interculturing and proper weeding.

It is also necessary that the soil is fairly good and supply of water assured.

This method has been introduced in the transplanting tract as well as in the drilled paddy tract with a slight modification of adopting dibbling of seeds at a fixed distance. This dibbling method is very popular with the cultivators and has considerably helped in increasing output of paddy per acre.

With a view to accelerating adoption of this method by farmers, a new scheme called Paddy " Pilot Scheme " has been introduced (1957) in Karvir, Panhala areas of this district. Under this scheme additional 10,000 acres of land (divided into suitable blocks) are to be brought under this method. Co-operative societies are to provide the additional finance required by the cultivator, even to a non-credit worthy cultivator who becomes a member of the society and undertakes to repay the loan on harvesting the crop. Fertilizers are also made easily available. Special staff is appointed for demonstrating the method in each village of the block. It is hoped this scheme will succeed in bringing sufficient acreage under this method.

3.2.17 Rice Nutritional Benefits

• **Excellent source of carbohydrates:** Rice is a great source of complex carbohydrates which is an important source of the fuel our body needs.

• **Good energy source:** Carbohydrates are broken down to glucose, most of which are used as energy for exercise and as essential fuel for the brain.

• **Low fat, Low salt, No cholesterol:** Rice is healthful for what it does not contain. Rice has no fat, no cholesterol and is sodium free. Rice is an excellent food to include in a balanced diet.

• A good source of vitamins and minerals such as thiamine, niacin, iron, riboflavin, vitamin D, calcium, and fiber.

• **Low sugar**

• **No gluten**

Rice is gluten free. All rice is gluten free, making rice the essential choice for people with gluten free dietary requirements.

• **No additives and Preservatives**

Rice contains no additives or preservatives, making it an excellent inclusion in a healthy and balanced diet.

• **Contains Resistant Starch**

Rice also contains resistant starch, which reaches the bowel undigested. This encourages the growth of beneficial bacteria, keeping the bowel healthy.

• **Non-allergenic**

• **Cancer Prevention and Diet**

Whole grains (such as brown rice) contain high amounts of insoluble fiber-the type of fiber some scientists believe may help protect against a variety of cancers.

• Rice is a low-sodium food for those with hypertension.

• It is a fair source of protein containing all eight amino acids.

3.2.18 Cleaning and Hulling

At the processing plant, the rice is cleaned and hulled. At this point, brown rice needs no further processing. If white rice is desired, the brown rice is milled to remove the outer bran layers. Hulling is the process to remove the hull from the kernel. Hulling can be done by hand by rolling or grinding the rough rice between stones. However, more often it is processed at a mill with the help of automated processes.

3.2.19 The process of Mechanical Hulling

The rough rice is first cleaned by passing through a number of sieves that sift out the debris. Blown air removes top matter.

- Once clean, the rice is hulled by a machine that the action of the hand held stones.
- The shelling machine loosens the hulls from the rice. About 80-90% of the kernel hulls are removed during this process.
- From the shelling machine, the grains and hulls are conveyed to a stone reel that aspirates the waste hulls and moves the kernels to a machine that separates the hulled from the unhulled grains.
- By shaking the kernels, the paddy machine forces the heavier unhulled grains to one side of the machine, while the lighter weight rice falls to the other end.
- The unhulled grains are then siphoned to another batch of shelling machines to complete the hulling process.
- Hulled rice grains are known as brown rice.

3.2.20 Drying

Drying is the process of simultaneous heat and moisture transfer. It is the removal of excess moisture from the grains. Once dried, the rice grain, now called rough rice, is ready for processing. Proper drying results in increased storage life of the grains, prevention of deterioration in quality, reduction of biological respiration that leads to quality loss of grains, and optimum milling recovery.

In the country three methods are used for drying the paddy grains, namely:

- Sun drying
- Mechanical drying
- Chemical drying

Sun Drying

Sun drying is a traditional method of drying the paddy grains. In fact, the major quantity of produce is being dried in the country by this method. Sun drying is the most economical method of drying grains. Grains are spread on drying surfaces such as concrete pavement, mats and plastic sheets and even on fields to dry naturally.

Mechanical Drying

Mechanical drying process means drying the grains by ventilating natural or heated air through the grain mass to get it evaporated the moisture from it. Mechanical dryers are more reliable since drying could be done anytime of the year.

Chemical Drying

Chemical drying method involves the spraying of common salt solution with specific gravity of 1.1 to 1.2 on the ears of the mature paddy crop. This treatment reduces the moisture content from 29% to 14.5% after four days.

3.2.21 Harvesting or Cutting

It is the process of gathering a crop. For rice, this generally refers to the cutting and gathering of panicles attached to the stalks. Once the plants have reached full growth (approximately three months after planting) and the grains begin to ripen-the tops begin to droop and the stem yellows-the water is drained from the fields. As the fields dry, the grains ripen further and harvesting is commenced. Depending on the size of the operation and the amount of mechanization, rice is either harvested by hand or machine. The different harvesting systems are as follows:

Harvesting Systems Manual Harvesting

Manual harvesting makes use of traditional threshing tools such as threshing racks, simple treadle threshers and animals for trampling or by

hand using sharp knives or sickles.

Manual Harvesting and Machine Threshing

Rice is manually threshed, then cleaned with a machine thresher.

Machine Reaping and Machine Threshing

A reaper cuts and lays the crop in a line. Threshing and cleaning can then be performed manually or by machine.

Combine Harvesting

The combine harvester combines all operations: cutting, handling, threshing and cleaning.

3.2.22 Milling

- Milling is the process where in the rice grain is transformed into a form suitable for human consumption, therefore, has to be done with ulmost care to prevent breakage of the kernel and improve the recovery.
- Brown rice is milled further to create more visually appealing white rice.
- After harvesting and drying, the paddy is subjected to the primary milling operation which includes de-husking as well as the removal of bran layers (polishing) before it is consumed. In this process the rice which is obtained after milling is called raw rice.
- Another process through which rice is obtained after milling is called "Parboiling Rice." Nearly 60% of the total rice produced in India is subjected to parboiling.
- Rice milling losses may be qualitative or quantitative in nature. Quantitative or physical losses are manifested by low milling recovery while low head rice recovery or high percentage of broken kernel reflects the qualitative loss in rice grains.

Method of Milling

a) Traditional Method

Before the advent of mechanical milling, hand-pounding traditional method of rice milling was in practice. In fact, hand-pounding rice has got more nutritive value as compared to machine milling rice. In hand-pounding, a variety of implements are used such as:

- Mortor and Pestle
- Dhenki
- Hand Stone (Chakki)

b) Mechanical Method

With the introduction of mechanical mills, hand-pounding method has steadily decreased because it could not compete with machine mills. The conventional mills in use can be categorized into three main types

- Huller mills
- Sheller-Huller mills
- Sheller-Cone Polisher mills.

3.2.23 Quality and Grading

As countries reach self-sufficiency in rice production, the demand by the consumer for better quality rice has increased. Quality of rice is not always easy to define as it depends on the consumer and the intended end use of the grain. Grain quality is not just dependent on the variety of rice, but also on the crop production environment, harvesting, processing and milling systems.

Characteristics Considered for Grading of Milled Rice

- Dead rice, brokens and brewers percentages
- Defectives
- Foreign matter
- Presence of paddy

- Whiteness
- Chalkiness
- Moisture content

Objectives of Establishing Standards and Grades

- To ensure only edible rice reaches the consumer.
- To improve post harvest practices so as to eliminate or reduce waste.
- To improve agronomic practices to increase farm yields.
- To improve processing practices for better milling recoveries and for market expansion.
- To protect consumers from price/quality manipulation.

Grades of Indian Rice

- **Common variety**: Short bold & long bold rice
- **Fine variety**: Medium slender rice
- **Superfine variety**: Long slender & short slender rice
- **Rice Processing**

Harvesting is the process of collecting the mature rice crop from the field. Harvesting at the right time and in the right way maximizes grain yield and minimizes grain losses and quality deterioration. The post-harvesting operations of paddy crop and the storage of grains are as much important as producing the crop, because post-harvesting technology affects the quantity and quality of paddy and the finished product, that is, rice. Generally, losses in paddy and rice during the post-harvest operations amount to about 10% of field production. It is, therefore, necessary to adopt proper technology after harvesting the crop for the improvement of the quantity and quality of paddy and rice. Post production includes all operations starting from harvesting up to grading and the stages are interdependent.

- The various steps involved are as follows:
- Cleaning and Hulling
- Drying Quality and Grading
- Harvesting or Cutting
- Milling
- Storage
- Threshing

3.2.24 Nutritional Facts about Rice

Rice remains a staple food for the majority of the world's population. Rice is very nutritious. This important carbohydrate is the staple food for more than two-thirds of the world's population who rely on the nutritional benefits of rice which are many.

3.2.25 Rice Nutrition Chart

The following chart gives an idea about the basic nutritional value of three types of rice white rice, brown rice and parboiled rice. The nutrients components of white and parboiled rice are those of unenriched rice which are different from enriched rice. Enriched rice are given back vitamins B1, B3 and iron that are lost during processing of rice but it lacks in some minerals like magnesium etc. that are present in brown rice.

Table No-3.1

Rice Nutrition Chart

Rice (1/4 Cup Raw)	Calories (kcal)	Carbohydrates(s)	Fat (g)	Fiber (g)	Protein (g)
WhiteRice Unenriched)	169	38.98	0.31	0.60	3.30
Parboiled (Unenriched)	172	37.80	0.26	0.79	3.14
Brown Rice	171	35.72	1.35	1.62	3.14

Source - www.ricetrade.com

3.2.26 Production of Rice in India

From a nation dependent on food imports to feed its population, India today is self-sufficient in grain production and also has a substantial reserve. The progress made by agriculture in the last four decades has been one of the biggest success stories of free India. Agriculture and allied activities constitute the single largest contributor to the Gross Domestic Product, almost 33% of it. Agriculture is the means of livelihood of about two-thirds of the work force in the country. India is the world's second largest rice producer, followed by China. The production of rice in India has shown an increasing trend which is evident from the Table given below:

Table No-3.2

Production Rice in India

YEAR	PRODUCTION (in million tonnes)
1950-51	20.58
1960-61	34.58
1970-71	42.22
1980-81	53.63
1990-91	74.29
1997-98	82.54
1998-99	86.08
1999-00	89.68
2000-01	84.98
2001-02	93.08

Source - www.ricetrade.com

The demand for rice in India is projected at 128 million tonnes for the year 2012 and will require a production level of 3,000 kg/hectare significantly greater than the present average yield of 1,930 kg/hectare. Government of India is targeting to achieve production of 129 million tonnes of rice by 2011-12 with the growth rate of 3.7% along with other foodgrains.

Table No-3.3

State-wise Production of Rice in India. (in million tones)

State	1999-2000	2000-2001
Uttar Pradesh	45.65	42.32
Punjab	25.20	25.32
Andhra Pradesh	13.70	14.53
West Bengal	14.92	13.83
Haryana	13.06	13.25
Bihar	14.39	12.06
Karnataka	9.86	10.95
Maharashtra	12.70	10.08
Rajasthan	10.68	10.04
Madhya Pradesh	21.27	8.93
Tamil Nadu	8.97	8.90
Orissa	5.62	4.98
Assam	4.04	4.17
Gujarat	4.05	3.68
Chhatisgarh	-	3.65
Jharkhand	-	2.01
Uttaranchal	-	1.73
Others	2.71	5.49

Source - www.ricetrade.com

3.2.27 Rice Storage

Storage is the process of keeping grains, whether in bags or in bulk, in a storage structure designed to protect the stored product from inclement weather and pests for a short or long period of time to await processing or movement to other location.

Reasons for Storing the Rice

- To provide uniform supply of food throughout the year, because grains are produced seasonally while consumption is fairly uniform throughout the year.
- To provide reserve for contingencies such as flood, drought and other calamities.
- To speculate on a good price either in domestic or in the export market.

Storage in bags is convenient for short term storage, where grain is intended for very early onward movement. For short term storage, no control measures against insects are needed. In loose/bulk storage method, large quantity of grains can be stored in per unit volume of space and the infestation of insects/pests is lower. The basic requirements of a good storage practice are: a healthy, clean and uniformly dried grain, and a structure that will maintain a suitable environment that will prevent pests.

3.2.28 State of Agricultural Marketing

The state of marketing of agricultural goods has not been so good, despite the efforts made by the govt. since independence.The bad state of affairs in the marketing of agricultural goods in the result of so many facts along with the existence of intermediaries. These are as follows-

1. The Indian farmers lack necessary storing facilities.This result in the rates eating away 10 to 20% of the produce.
2. The indebtedness of farmers does not allow them to wait for better prices for their produce. Farmers sell their produce immediately after harvesting at lower prices as they are in hurry to pay off their old debts.

3. The transport facilities in the villages are in very bad shape, creating problem in the transportation of agricultural produce. Further the small and marginal farmers can't afford to have their own vehicle to carry their goods to the market.
4. The existing mandi's do not provide warehouses to farmers to keep their stocks of commodities, even though if they want do wait for some time before the sell their commodities.
5. The collusion between the dalal and whole sellers helps the wholesalers to settle the price generally to the disadvantage of farmers.
6. The margins of reaped by the intermediaries are so high that farmers only mange to get 50% or even less of the price of their produce.
7. The farmers are illiterate as well as ignorant. Therefore, they generally do not have much information of prevailing market prices. This helps the dalals and wholesalers in cheating farmers by paying lower prices. By taking commission for various reasons etc.
8. Lack of timely agricultural credit has also made the position of farmer's vulnerable. Farmers generally take loans from village money lenders, who charge exorbitant interests rates on loans and thus exploit the farmers.
9. Considering these defects, in the agriculture marketing in India, there is urgent need to device a just marketing system which will protect the interest of both the farmers and consumer for this, the marketing system should fulfill following three conditions.

3.2.29 Main Causes of Backward Agricultural Economy

Indian agricultural is a primitive occupation to provide employment to the growing population for just survival. Due to the excess population, ten people cultivate one acre of land when one is

sufficient to cultivate ten acres of land efficiently. The following reasons are responsible for keeping Indian agricultural to its backwards status.

1) Illiteracy of the People-

Indian farmers are illiterate, ignorant and insufficient to improve the agricultural. The insight and foresight of the people should be consolidated for the generation of amity and solidarity in the economy. Due to the ignorance and un-identity of their responsibility Indian agricultural remained in the same status.

2) Lazy People-

Indian farmers remain unemployed for more than seven months in a year. During their unemployment time, they should search a job to earn an income. The laziness of people kept Indian agriculture in its original backwards economy.

3) Vagaries of Monsoons-

Indian agricultural is mostly dependent upon monsoon which are uncertain and therefore, agricultural income in India also uncertain. Water facilities are made available recently but perennial water supply is still absent.

4) Absentee Landlordism-

Actual landlords reside in cities and cultivations are not the owners. Both do not prefer to invest fund to improve agriculture. Landlords suspect cultivativators sow the seeds and even do not take care for weeds. Land fertility decreases due to weeds and nobody is a careful to improve the land income. But Indian agricultural is its subsistence level.

5) Absence of Institutional Credit Availability-

Banks and any or many financial institutions do not advance crop loans due to uncertainty of crops. There are non-institutional and unscrupulous money- lenders, traders, indigenous bankers who lend

against lends. Borrower farmers are generally unable to repay the debt in time. The money-lenders confiscate the lands .Thus, landlord become landless agricultural labourers.

6) Absence of Transport Facilities –

Farmers are not facilitated by transport and communications. They are compelled to sell their annual products in rural areas at lowest prices. Thus, they cannot collect expected income due to the sale at fewer prices even though price may be high in urban markets. Farmers are unable to carry their productions to cities for sale. Roads are not well equipped and during rainy season, roads are blocked and new from urban areas is not available as communications are not advanced. Recently, some improvements are being introduced carry agricultural goods in organized markets of cities.

7) Sale of Money-Lenders-

Farmers while taking loans agree to sell their products to money-lenders who lenders who impose condition to sell the goods to them, otherwise, they do not advance money. They charge highest rate of integrate and purchase the products at the lowest prices. Farmers suffer from both ends.

8) Absence of farm Technology-

At present, pesticides, insecticides, mechanization high-yielding varieties of seeds, etc. are not fully made available to all over India. To protect crops, at present, medicines are available but Indian farmers are not aware of this facility.

9) Absence of Crop Insurance-

Farmers do not get the crop insurance facility. Crop failure at regular intervals makes farmers too much nervous. Many poor farmers commit suicides as they unable to repay the debt with interest.

10) Sub-division and Fragmentation-

Lands are divided among the part centers of the family. The cost of cultivation is more than the income from lands. Small farmers are unable to get loans from institutions and therefore they are unable to implement any improvements of their land.

11) Defects of Cropping Patterns-

Rotations, double cropping patterns are not properly furnished by farmers. Due to the defective cropping patterns, the yields are less than expectations. Rotations enhance the fertility of the soil.

12) Absence of Research and Development-

In many industrial and commercial occupations furnish the recent and decent research inventions and improvements. While agricultural continues the old and traditional cultivation which yields less.

Thus, agricultural remained in its original toto and motto. Farmers attempt to agriculture lands in to small plots for the construction of houses. They are not conscious or confident to reap more crops, fruits, flowers, etc. from their lands. They should have to invest their wit and wisdom to make lands as more potential.

3. HISTORY OF GHANSAL RICE

3.3.1Introduction

In Kolhapur District 'Ajara Taluka' is situated in the rural economically backward and hilly area of the Western Ghats. This area is famous for heavy rain and for production of Ghansal Rice (variety of rice). It is situated in the bank of Hiranykeshi and Chitri Rivers and surrounded by several hills. As per people's opinion, it is likely to hill station.

Ghansal Rice is simple short grain rice, in this rice is the leading crop of the study area locally called as 'Ghansal Bhat'. It is sowing in June, and harvested from about the middle of October onwards depending upon whether. It is the loving tropical crop requiring high temperature and well distributed rainfall between 1800 to 3500 mm during the growing season.

Ghansal Rice principally a tropical crop requiring high temperature and humidity for its growth. Distribution of rice is mainly dependent upon climate condition rather than said condition. The critical mean temperatures for flowering and fertilization rangers from 16% to 31%. Most important cropping season is Aman (Kharif) Season, in which paddy is cultivated on large scale with the onset of Monsoon.

Also known as the 'King of Rice' this highly aromatic grain that is short and elegantly thin, has originated from 'Ghansal' which means two wards are derived one is 'Ghan' means 'Aroma' and 'Flavour' and second is 'Sal' means 'Elegantly Bhat'. Ghansal rice has been cultivated at the merely Ajara Taluka famous rice and Saatvic or Pure, is nourishing for the body tissues and is easy to digest. To obtain the current aroma and flavour of Ghansal rice, proper ageing is required to reduce its moisture content. The best quality of Ghansal rice comes from the Ajara Taluka, 'Dhabhil' village, known as the 'rice bowl' of Ajara. Ghansal rice is now

grown in Dhabhil, Shelap, Latgaon, Yemekond, Parpoli, Vatangi, Uchangi, Chaphwade, Chitale, Bhavewadi, Polgaon, Gavase, Morewadi, Bolakewadi, Hattiwade, Devarde, Haloli, Yerndol, etc.

3.3.2 Importance of Ghansal Rice

Rice is foremost crop of the world and it is the staple food of over 60% of the world population. Ghansal rice is famous of Ajara Taluka. It is useful to rituals and ceremonies connected with birth, marriages and funerals from very ancient times. Most of the people consumed by human being after cooking as whole rice or by preparing products likes Bhakari, Idali, Dossa or Uttappa.

Ghansal Rice is foremost of saatvic or pure, is nourishing for the body tissues and is easy to digest. In this rice are more suitable for aroma and flavor of rice.

3.3.3 Characteristic of Ghansal Rice

1. Aroma

The most important characteristics of them all is the aroma and flavour, the aroma in Ghansal Rice arises from a cocktail of 100 compounds – hydrocarbons, alcohols, aldehydes and esters. A particular molecule of notes is 2-acety-1-pyrroline.

Colour

The colour of Ghansal Rice is creamy white to white. But the most commonly used is white used is white Ghansal Rice.

2. Grain

Ghansal Rice is the fine grain and scented rice (3.61 – 5.5mm). Having best flavor and aroma other than other variety.

3. Origin

It is traditional and elegantly rice specially of Ajara. It is worldwide famous variety of rice..

4. Shape

Shape or length to width ratio is another criterion to identify Ghansal Rice. This needs to be over 3.0 mm .in order to qualify as rice.

5. Texture

Ghansal Rice is derived from the amylase content in the rice. Dry, firm separate grain, upon cooking, the texture is firm and tender without splitting and it is non-sticky.

6. Elongation

The Ghansal Rice elongates almost twice upon cooking but does not fatten much. When cooked the grains elongate (60 – 110%) over the precooked grain, more than other varieties.

7. Benefits

Aromatic fragrance and dry texture and nourishing and is easy to digest, it is pure saatvic and favorable.

3.3.4 Agronomic Features of Ghansal Rice

1. The Ghansal Rice is very tall and weak and hence prone to lodging.
2. Ghansal Rice is photo-period sensitive and not susceptible to most of the insect pests and diseases.
3. Generally, productivity of Ghansal Rice in traditional growing areas is as low as 15 to 20 quintals per acre.
4. Breakage percentage of long and extra grain on milling is very high, giving lower head recovery.
5. At the stages of the crop growth and in almost all parts of the plant, the typical aroma of Ghansal is evident. The principle aroma

compound responsible for the unique flavor of Ghansal Rice has been identified as 2-acetyle-1-pyrroline.

6. Ghansal Rice varieties are known to produce better aroma when these cultivars are exposed to humid weather conditions during ripening. Hence the Ghansal Rice relatively cooler temperatures and natural environment (27°C in day and 23°C at night) during crop maturity for better retention of aroma.
7. Timely sowing and transplanting of Ghansal Rice is an important factor in determining gain yield and quality parameters.
8. The Ghansal Rice exhibits location, land and soil effect quite considerably. Therefore the best quality of Ghansal Rice is grown in traditional areas due to an interaction of genotype, soil and environmental factors.
9. Early sowing or transplanting in proper periods i.e. up to 31 days late affect the yield flavouring stage.
10. Also, early transplanting of traditional varieties prolonged the duration of vegetative phase resulting into a tall and leafy crop such a crop is more prone to lodging because of excessive vegetative growth and plant height.

3.3.5 Area Producing Ghansal Rice

Agricultural sector Ghansal Rice is one of the most important crop grown in the Western Region of Maharashtra. The rice from the Ajara Taluka is most famous for the cultivation of Ghansal Rice in bulk quantity produced in this area.

Ajara Taluka Ghansal variety of rice is traditional and 50% to 60% villages are cultivated in this rice. The reducing yield of Ghansal Rice .The area under its cultivation was reduced. However, from the last 4-5 years efforts made by different agencies have led to gradual increase in

Ghansal Rice cultivation. The production of Ajara Taluka more than (60%) of Ghansal Rice under village 'Dhabhil' and best quality of rice in this area.

The Ajara Taluka total area presently under cultivation of Ghansal Rice is 100 hectares its production is about 350 tonnes of rice. Ghansal Rice now grown in Dabhil, Shelap, Latgaon, Yemekond, Parpoli, Gavase, Morewadi, Bolakewadi, Medholi, Deverde, Parewadi,Haloli, Pernoli,Harpavde,Korivade, Vatangi,Uchangi and other etc.

The district of Kolhapur is recognized as a district of Kharif crop belt. The principal Kharif grown in this region consist of Rice, Groundnut and Soyabean are important Cash Crops. There is large scope in increasing the growth production and the trend is increasing. The variety of Ajara Rice commonly known as Ajara Ghansal grown in Kolhapur district is typically aromatic in nature and is one of the major cash crops of the region. There exist proper crop management and workshop related to crop cultivation is organized in order to boost production. Presently the most important activity undertaken is marketing of Ajara Rice(Ghansal) both nationally and internationally. This activity is undertaken with the help of Local self Government body called Zilla Parishad

3.3.6 Ajara Ghansal

The Ajara Ghansal variety of Rice is known far and wide across the globe for its taste and aroma. Apart from the available variety viz: Basmati which is world famous, the Ajara Ghansal variety of rice is known for its nutrition, taste and aroma and has great demand in international market and is in process of exporting to European and African countries.

3.3.7 Prominent Features of Ajara Ghansal

1. It has aromatic nature of a typical kind.
2. Production per hectare is less but can fetch good financial returns.
3. Duration of harvesting period is 150 to 160 days.
4. Require cool temperature for proper growth.
5. Ajara Ghansal is typical local variety which best aromatic and flavor characteristics only in ajara taluka area other than other areas.

3.3.8 Marketing of Ajara Ghansal

This variety of rice is entering into the market full fledge under the Brand name of Ajara Ghansal. The first and foremost task is being adopted to target market in big cities such as Mumbai, Delhi, Pune and Kolhapur. In the initial phase of promotion of the rice product Grain merchants, Malls and shopping centers located in these cities would be prime concern. Due importance will be given for packaging, dispatch as per international standards. The rice is polished by traditional ways manually instead of mechanized polishing that is done in Industries by means of machine, for this reason the aromatic taste remains intact and preferred and there is great demand for it.

We DOTS Worldwide Enterprises is associated with local self government bodies and local marketing bodies which provides information to the cultivators on market demand of Ajara Ghansal. We provide information and guidance to the local rice cultivators on various crop management techniques in order to increase production of Ajara Ghansal per hectare and assist them to capture untapped foreign market though our Nordic business match making partners. Thus we are the entrepreneurs in encouraging exports of Ajara Ghansal overseas.

3.3.9 Subsistence Level of Cultivation

Agricultural ones were cultivated on traditional methods and farmers cultivated land as the way of life. Farmers were never assured even to recover their investments. The details of subsistence are produced as under:

1) Primitive Method of Cultivation

Farmers in India were strangers or rather unknown to the present scientific method of cultivation. Their instruments for harrowing, sowing and reaping were made up of wood or iron which were ultimately not durable nor capable of increasing the productivity of the soil. Traditional manures and seeds were used. They could not use high yielding varieties of seeds and chemical fertilizers to increase the overall production and product of farmers. The productivity of the soil was also poor, and farmers did not know to increase the productions.

2) Reliance on Rain

Farmers were waiting for the rain which was uncertain. Sometimes, rainfall was too much and many times, the rainfall was nil. Farmers lost their annual crop due to the vagaries of the rainfall. Adequate rainfall was rarely available to farmers. Irrigational facilities were totally absent and water was made available through the wells here and there. However, water was scanty but not plenty. Coastal areas were receiving heavy rains paddy was the only crop. Remaining parts suffered from the inadequacy of rains.

3) Non –Availability of Institutional Finance

Money- lenders were the main suppliers of loan to poor farmers against the land. Banks were reluctant to advance loans to such farmers due to the uncertainty of crop and farmers were unable to mortgage any security against loans. But these unscrupulous money lenders charged exorbitant rate of interest which retained farmers in debts. Farmers were

born in debt, lived in debt and died in debt. If farmers were unable to repay the debt. Money- lenders confiscated the land s of farmers. Thus even big landlord become landlords become land less laborers.

4) Meagre Prices

Farmers never received promising prices for their products. There were agents who purchased the entire production at less prices due to absence of organized markets.

5) Over-Population

All survived on lands even new arrivals in the family have no other means. Ten cultivated one acre when one can easily cultivate ten acres of land. Sub-divisions and fragmentations were the results due to the over – population.

3.3.10 Mechanization

Once agriculture practiced the old traditional method from which no guarantee was issued to get an assured income from agricultural. At present agricultural is complete mechanized? From harrowing to harvestings. Machines are used to attain and uniformity, rapidity and yielded more expected incomes.

Tractors are used to soften the mud. It is essential to soften the soil to fasten the growth. Tractors separate weeds from the lands deeply from which seed cannot be troubled by weeds. Tractors separate weeds from the land and only seeds can remain in the land. Such seeds can grow rapidly without any delay not worries.

Afterwards, sowing will take place. At present, science is used to put seed in to the lands. The scientific mode becomes the code of sowing the seed. Hastage, wastage, etc. are totally removed to move towards improvements. Such practices can save human power and pave the overall agricultural scene.

Medicines are used to protect crops. Pumps are used to water the lands. Formerly the old bullock-practice was popular. But this was delaying the supply of water. Electricity pumps extract water to crops in time and in adequate quantity. Recently, sprinkling water scheme became more attractive to supply water to all types of crops in their respective required quantity. Water facilities mark or remark with their trademarks.

3.3.11 Farm Technology

Farm technology introduced certainty in the collection of agricultural production which was uncertain. Chemical fertilizers increase soil fertility to assure crop certainties. After wards, high yielding variety seeds are being used in a short period. The feature of such seeds is to yield much production with in a short period. The feature of such seeds is to yield much production within a short period. Formerly, only one crop was reaped in a year but at present, double and multiple crops are being reached during a year.

Cash crops become popular day by day due to the crop protection schemes like pesticides, insecticides, etc. Formerly, crops were dependent on rains at present irrigational facilities supply water and therefore cash crops like Sugarcane, and Turmeric etc. replaced all food grains. Farming technology popularized fruits and flowers with some traditional food grains. Panjab and Haryana produced wheat in a large quantity based on farm technology.